Global Trends and Research Evolution of XBRL Adoption in Financial Reporting

Loso Judijanto¹, Septi Wifasari², Rianto³, Rio Eldianson⁴, Riny⁵

⁵ Universitas Mikroskil

¹ IPOSS Jakarta
² Binus University
³ Universitas Islam As-Syafiiyah
⁴ Sekolah Tinggi Ilmu Ekonomi GICI

Article Info

Article history:

Received Jul, 2025 Revised Jul, 2025 Accepted Jul, 2025

Keywords:

Bibliometric Analysis; Financial Reporting; IFRS; Information Asymmetry; XBRL

ABSTRACT

This study explores the global trends and intellectual structure of research on XBRL (eXtensible Business Reporting Language) adoption in financial reporting through a comprehensive bibliometric analysis. Utilizing the Scopus database and VOSviewer software, data from 2000 to 2024 were analyzed to identify publication patterns, author collaborations, thematic clusters, and emerging research frontiers. The results indicate that early research predominantly focused on the technical and administrative aspects of XBRL implementation, particularly in the context of financial reporting standardization. Over time, the field has shifted toward evaluating the regulatory, economic, and organizational impacts of XBRL, including its role in reducing information asymmetry, enhancing investor transparency, and aligning with global reporting frameworks such as IFRS. The United States emerged as the leading contributor, while growing scholarly interest is observed in emerging economies like Malaysia and Jordan. Keyword co-occurrence analysis highlights evolving themes and the interdisciplinary nature of the field, suggesting opportunities for deeper theoretical engagement and broader geographic inclusion. This study offers a strategic overview of the development of XBRL research and identifies key directions for future inquiry.

This is an open access article under the <u>CC BY-SA</u> license.



Corresponding Author:

Nama: Loso Judijanto Institution: IPOSS Jakarta

Email: losojudijantobumn@gmail.com riny.wang@mikroskil.ac.id

1. INTRODUCTION

In the digital era, financial reporting has undergone significant transformation, driven by the necessity for real-time, transparent, and standardized financial information dissemination. One of the pivotal innovations supporting this transformation is eXtensible Business Reporting Language (XBRL), an open international standard for

digital business reporting. XBRL enables the electronic communication of financial data, allowing for automated processing and improving data comparability, accuracy, and timeliness [1], [2]. Originally developed to overcome limitations of traditional reporting formats such as PDF or paper-based disclosures, XBRL is now widely recognized as a cornerstone for enhancing transparency

and regulatory oversight in both public and private sectors [3].

Since its formal introduction in the early 2000s, XBRL adoption has steadily grown across jurisdictions, catalyzed by regulatory bodies and standard-setting organizations. The United States Securities and Exchange Commission (SEC) mandated XBRL filings for public companies in 2009, a milestone that significantly accelerated global interest in the format [4]. Following this precedent, countries such as China, Japan, the United Kingdom, the Netherlands, and India have initiated similar mandates, although the pace and scope of adoption vary widely. These differences are shaped by local regulatory technological environments, infrastructure, market maturity, and the willingness of stakeholders to embrace digital transformation in financial reporting [5].

In academia, XBRL has attracted increasing scholarly attention as researchers seek to understand its implications for accounting practices, market efficiency, regulatory compliance, and user behavior. A growing body of literature has explored the effects of XBRL on information asymmetry, analyst following, audit quality, investor decision-making, and corporate governance [6], [7]. Moreover, comparative studies have emerged to analyze cross-country adoption patterns, highlighting the institutional and cultural factors influencing the success of research implementation. These contributions have shaped a multidisciplinary discourse, spanning accounting, information systems, finance, and public policy.

Despite the expanding interest, the global landscape of XBRL research remains fragmented, with studies dispersed across diverse themes, methodologies, geographical contexts. While some focus on the technological integration and cost-benefit tradeoffs of adoption, others emphasize stakeholder perceptions or regulatory impacts. Additionally, there is a noticeable shift in recent years toward the integration of XBRL with emerging technologies such as blockchain, AI-driven financial analysis, and sustainability reporting [8], [9]. This suggests that the evolution of XBRL research mirrors

broader digitalization trends in the corporate reporting ecosystem, underscoring the need to synthesize and map these developments comprehensively.

To few studies date, systematically analyzed the intellectual structure and evolution of global research on XBRL adoption using bibliometric and scientometric methods. Most literature reviews on XBRL have relied on qualitative summaries or thematic categorizations, which, while insightful, may overlook patterns in authorship networks, journal cocitation trends, or the emergence of new research frontiers. A bibliometric mapping of the field can offer a data-driven perspective on how XBRL research has developed over time, what clusters of knowledge exist, who the leading contributors are, and which directions are likely to shape future inquiry. Such analysis is crucial not only for scholars seeking to navigate this growing field but also for regulators and practitioners aiming to align policy frameworks with evolving academic insights.

Despite the growing number of studies XBRL, there is limited understanding of the overarching knowledge structure and evolutionary trajectory of this research domain at the global level. The existing literature is scattered across disciplines, lacks integration, and seldom addresses longitudinal trends, research hotspots, underexplored or gaps systematically. Consequently, stakeholders, including researchers, policymakers, and adopters, face difficulties in identifying influential studies, emerging themes, and the trajectory of scholarly discourse XBRL adoption. on fragmentation hampers the ability to derive coherent insights and formulate informed strategies for promoting effective harmonized use of XBRL in financial reporting globally. This study aims to map the global trends and research evolution of XBRL adoption in financial reporting using a bibliometric approach.

2. METHOD

This study applies a quantitative bibliometric analysis to explore the global trends and research evolution of XBRL adoption in financial reporting. Bibliometric methods are effective in mapping the structure, development, and patterns of literature using publication metadata, and they are particularly suited for assessing the maturity and dynamics of research domains [10]. The focus of this study identify publication trends, key contributors, influential articles, thematic clusters, and collaboration networks within the XBRL research field. This method provides a systematic and replicable approach to reveal the intellectual landscape and guide future inquiry.

The data were retrieved from the Scopus database, which was chosen due to its broad and multidisciplinary coverage of peerreviewed academic journals, including toptier publications in accounting, finance, and information systems. The search strategy employed the keywords "XBRL" OR "eXtensible Business Reporting Language" in combination with "financial reporting" in

article titles, abstracts, and keywords. The search was limited to the period between 2000 and 2024 to capture the full trajectory of XBRL-related research from its inception to the present. Only journal articles and conference proceedings published in English were included. The resulting dataset was exported in .csv and .ris formats for cleaning, analysis, and visualization. Duplicates, unrelated articles, and false positives were removed through manual screening.

For the bibliometric mapping and visualization of the data, the study utilized VOSviewer, a specialized software tool designed for constructing and analyzing bibliometric networks [11]. Several analyses were conducted: co-authorship analysis to explore collaboration patterns among authors and institutions, co-citation analysis to determine the intellectual structure of the field, and keyword co-occurrence analysis to identify major research themes and emerging topics. Temporal trend analysis was also carried out to assess the evolution of XBRL research over time.

3. RESULT AND DISCUSSION

3.1 Co-Authorship Analysis

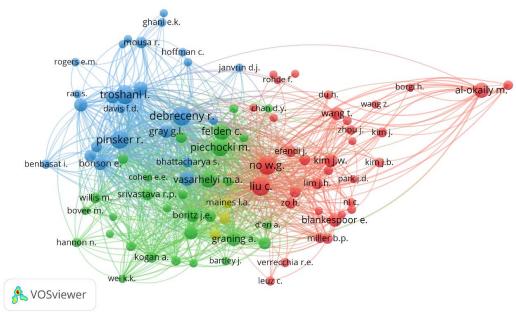


Figure 1. Author Visualization Source: Data Analysis

Figure 1 above illustrates a co-authorship or co-citation network among

researchers in the domain of XBRL adoption in financial reporting. The

nodes represent individual authors, while the size of each node reflects the volume of their contributions or citation strength. The edges (lines) indicate collaborative or citation relationships, and their thickness denotes the strength of these connections. The network is clustered into four major color-coded groups, suggesting distinct thematic or collaborative communities. For example, the red cluster, including prominent authors such as al-okaily m., no w.g., and

liu c., likely focuses on XBRL in the context of emerging markets regulatory impacts. The green cluster, featuring boritz j.e., graning a., and maines l.a., appears to concentrate on audit quality, reporting accuracy, and financial transparency. Meanwhile, the blue cluster, with authors like pinsker r., debreceny r., and troshani i., may emphasize technology adoption, implementation frameworks, or system usability.





Figure 2. Country Visualization Source: Data Analysis

Figure 2 visualization presents a country co-authorship network in XBRLrelated research, highlighting collaboration international patterns. Each node represents a country, with the node size indicating the volume of research output, and the connecting lines showing the strength and frequency of co-authorship links. The United States emerges as the most prominent and central node, reflecting its leading role in publishing and international collaboration on XBRL topics. Notable partnerships are observed between the United States and China, Australia, and

Germany, forming a core hub transnational research activity. Malaysia, France, and Jordan also appear as active contributors, although with more regionalized or bilateral collaboration patterns, such as between Malaysia and France or Jordan and Ireland. The network reveals distinct clusters. research suggesting geographic communities, yet also points moderate fragmentation, with regions (e.g., the Middle East and Southeast Asia) appearing less integrated into the global research nexus.

3.2 Citation Analysis

Table 1. Most Cited Article

Citations	Author and Year	Title
176	[9]	The production and use of semantically rich accounting reports on
		the Internet: XML and XBRL
166	[12]	Digital systems and new challenges of financial management -
		fintech, XBRL, blockchain and cryptocurrencies
145	[13]	Does XBRL adoption reduce information asymmetry?
138	[14]	Initial evidence on the market impact of the XBRL mandate
119	[15]	Costs and benefits of XBRL adoption: Early evidence
119	[16]	The determinants of inter-organizational and internal in-house
		adoption of XBRL: A structural equation model
97	[17]	XBRL's impact on analyst forecast behavior: An empirical study
92	[18]	Does Information-Processing Cost Affect Firm-Specific Information
		Acquisition? Evidence from XBRL Adoption
82	[19]	Towards the global adoption of XBRL using International Financial
		Reporting Standards (IFRS)
82	[20]	Innovation diffusion: A stakeholder and social network view

Source: Scopus, 2025

3.3 Keyword Co-Occurrence Analysis

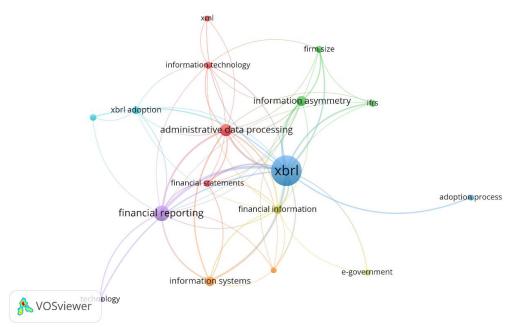


Figure 3. Network Visualization Source: Data Analysis

Figure 3 is a keyword cooccurrence map that reveals the thematic structure of scholarly literature on XBRL (eXtensible Business Reporting Language). Each node represents a keyword, with the size indicating its frequency in the dataset, and the lines between nodes (edges) signifying cooccurrence relationships in the same publications. The central keyword, unsurprisingly, is "XBRL", which connects to various thematic clusters, suggesting a multidisciplinary research field spanning accounting, information systems, public administration, corporate governance.

The blue cluster, which includes keywords like "xbrl adoption," "adoption "administrative process," and processing," primarily reflects research focused on the implementation and adoption mechanisms of XBRL. Studies within this theme tend to explore how organizations and governments transition from traditional to digital reporting systems, identifying drivers, barriers, contextual factors influencing adoption. This cluster is crucial for understanding the sociotechnical aspects of XBRL integration and for evaluating the readiness of firms and institutions to embrace structured data formats.

In contrast, the green cluster represents themes associated with firm characteristics and market outcomes, including keywords like "information asymmetry," "firm size," and "IFRS." These studies tend to examine the impact of XBRL on financial transparency, investor behavior, and market efficiency. For example, research under this cluster often investigates how XBRL reduces information asymmetry between companies and stakeholders, enhances analyst coverage, or interacts with other regulatory frameworks such as the International Financial Reporting Standards (IFRS). This strand literature contributes to the assessment of XBRL's effectiveness from a capital market perspective.

The red and orange clusters delve into technical and systemic dimensions of XBRL. The red cluster includes keywords such as "information technology," "XML," and "financial statements," indicating that this body of research focuses on the technological foundations and data architecture behind XBRL reporting. These studies often adopt perspectives from computer science or information systems evaluate XBRL taxonomies, system interoperability, and data processing tools. Meanwhile, the orange cluster, with terms like "information systems," "egovernment," and "financial information," addresses the institutional infrastructure aspects, particularly in the public sector, where digital government initiatives are integrating XBRL for improved transparency and accountability.

The purple cluster highlights research that directly links XBRL to financial reporting and regulatory including practice, keywords "financial reporting" and "technology." This cluster is foundational, as it connects the conceptual essence of XBRL with the accounting domain. Studies in this category evaluate how XBRL affects reporting quality, standard-setting, and practices. dense compliance The interconnections between clusters indicate that XBRL research is not isolated within one discipline but is interdisciplinary and evolving, with increasing overlaps among technical, regulatory, and financial perspectives.

Figure 4. Overlay Visualization Source: Data Analysis

Figure 4 is a temporal keyword co-occurrence map, which illustrates how research topics in the domain of XBRL (eXtensible Business Reporting Language) have evolved over time. Each node represents a keyword, with its size reflecting the frequency of its occurrence, and the color indicating the average publication year, ranging from dark blue (earlier years, ~2015) to yellow (more recent years, ~2019). The central node, "xbrl," is the most prominent and frequently occurring term, highlighting its position as the core subject of the literature. Surrounding this are strongly connected terms such as "financial "financial statements," and reporting," "administrative data processing," indicating that early research focused on the technical and reporting foundations of XBRL.

Over time, newer research themes have emerged, particularly those highlighted in yellow, such as "firm size," "information asymmetry," "IFRS," and "adoption process." These newer terms suggest a shift in research focus from

and system development standardization (seen in earlier years) to the economic and regulatory impacts of XBRL adoption. For instance, emergence of "information asymmetry" and "firm size" as recent topics signals a growing interest in how XBRL affects market dynamics, firm transparency, and investor behavior. Likewise, the linkage with "IFRS" implies expanding inquiry into the convergence of financial reporting standards and the implications digital reporting on global harmonization. This map also highlights a diversification of research directions, where newer studies increasingly bridge accounting with technological governance including "easpects, government," "information systems," and "technology." While these appeared earlier (in blue and green), they remain integral to the ecosystem, reflecting ongoing efforts to embed XBRL into broader digital infrastructure and public sector modernization.

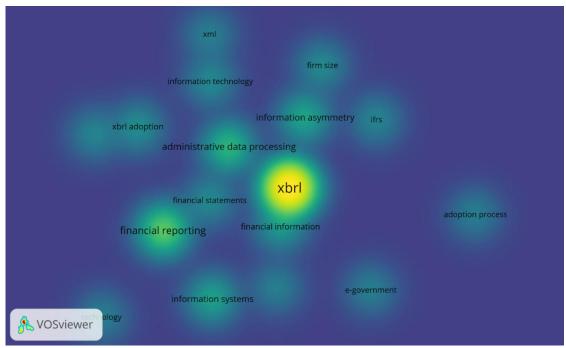


Figure 5. Density Visualization Source: Data Analysis

Figure 5 displays the density of keyword occurrences within scholarly literature on XBRL (eXtensible Business Reporting Language). In this map, brighter colors, especially yellow, represent high-frequency keywords, while darker blue areas indicate lower densities of usage. The term "XBRL" itself is positioned at the center and shown in bright yellow, signifying its dominance and centrality in the dataset. Closely associated keywords such as "financial reporting," "financial information," "administrative data processing," and "financial statements" also exhibit higher density levels, suggesting that these themes have been the most frequently studied and are foundational to the field. In contrast, keywords located on the periphery, such as "adoption process," "firm size," "e-government," and "technology", appear in cooler shades, indicating emerging or less explored areas within the research domain. This suggests growing but still relatively underdeveloped lines of inquiry into the organizational and technological dynamics surrounding **XBRL** implementation. The presence of terms like "information asymmetry" and "IFRS" in moderately dense zones implies a transition in focus toward evaluating the broader market and regulatory impacts of XBRL.

3.4 Discussion

a. Dominant Themes and Foundational Topics

The keyword co-occurrence and density visualizations clearly establish "XBRL" as the central hub of research, surrounded by highfrequency terms such as "financial reporting," "financial statements," "administrative data processing," and "financial information." These associations suggest that early and core research focused heavily on the role of XBRL in improving the quality, structure, and accessibility of financial disclosures. This aligns with the fundamental objective of XBRL, to standardize reporting for ease of analysis and regulatory compliance [13]. The prominence "administrative data processing" and "information systems" within the same cluster points to a significant body of literature at the intersection

accounting and information technology, where scholars have investigated the technical infrastructure needed to adopt XBRL effectively. These studies are rooted in systems implementation, digital governance, and the transformation of accounting functions through ITbased solutions [14]. The strong cooccurrence of these terms suggests that XBRL research remains deeply interdisciplinary, drawing from both financial accounting standards and digital innovation.

b. Evolution Toward Impact and Governance-Oriented Research

As revealed by the temporal analysis, research themes have evolved from foundational system design and taxonomy development (pre-2015) toward market outcomes and institutional impacts in more recent years. Keywords such as "information asymmetry," "firm size," "IFRS," and "adoption process" have emerged with lighter colors, indicating a shift in scholarly interest toward evaluating how XBRL affects transparency, corporate capital market dynamics, and firm behavior. This shift mirrors global trends in accounting research, which increasingly seek to demonstrate the real-world implications of digital reporting frameworks [15]. instance, the growing emphasis on "information asymmetry" suggests that are now scholars investigating XBRL's ability to reduce gaps between insiders and external stakeholders, especially investors and analysts. Research has found that XBRL improves the timeliness and accessibility of data, thereby enhancing investor decision-making reducing reliance intermediaries [16]. Similarly, studies examining the interaction between "XBRL adoption" and "firm size" indicate that organizational readiness, resource availability, and compliance burden are important mediators of XBRL's success, particularly in small and medium enterprises (SMEs).

c. Collaborative Patterns and Intellectual Structure

The co-authorship network visualized through VOSviewer reveals the existence of distinct author clusters, indicating thematic groupings and collaboration communities. For example, prominent scholars such as Debreceny R., Pinsker R., and Troshani I. form one major network, likely centered around system implementation and regulatory guidance in the U.S. and Australia. In contrast, authors such as Liu C., No W.G., and Kim J.W. represent another cluster with a strong presence in East Asian contexts, particularly focusing on empirical investigations of XBRL's market and firm-level impact. These clusters reveal an intellectual division of labor, where different academic communities concentrate on specific facets of XBRL research, ranging from technical implementation to financial consequences. Despite moderate cross-cluster linkages, the authorship network also reveals fragmentation, suggesting a need for more cross-border, interdisciplinary collaborations. Such integration could help consolidate knowledge, prevent duplication, and foster more holistic research agendas that align with global regulatory developments and emerging technologies such as AI or blockchain-based financial systems.

d. Global Disparities and Regional Contributions

The country collaboration map indicates that the United States dominates XBRL research, both in terms of output and international collaboration. This is consistent with the early adoption of XBRL in the U.S. via SEC mandates and the presence of advanced IT infrastructure. Countries

like China, Australia, Germany, and Malaysia also emerge as significant contributors, though with varying degrees of interconnectivity. For instance, Malaysia has strong ties with France and emerging collaborations with Jordan, indicating growing regional interest in digital financial transformation. However, the visualization also underscores the underrepresentation of developing regions, such as Africa, Latin America, and parts of Southeast Asia. These areas often face challenges in terms of infrastructure, regulatory enforcement, and human capital, which may hinder scholarly output and practical adoption of XBRL. As XBRL moves from being a compliance to a strategic reporting mechanism, there is a pressing need for inclusive research agendas that incorporate diverse regulatory market conditions, environments, and governance cultures [17].

e. Emerging Research Frontiers and Theoretical Implications

Beyond empirical and descriptive studies, there is a rising interest in connecting XBRL with broader theoretical frameworks. For example, recent studies have started to explore how XBRL adoption aligns with institutional theory, stakeholder and legitimacy theory, theory, especially in contexts where firms seek to gain legitimacy through enhanced disclosure practices. This theoretical turn enables scholars to better understand not just the "what" and "how" of adoption, but also the "why" behind organizational behavior and regulatory responses. Another emerging area **XBRL** integration of with sustainability reporting and ESG

disclosures, especially as regulators begin to standardize environmental data formats. There is also growing curiosity about how XBRL can interact with machine learning, realauditing, and blockchain, potentially transforming landscape of assurance, governance, and decision-making. These intersections mark new research frontiers that warrant interdisciplinary collaboration and methodological innovation.

4. CONCLUSION

This bibliometric study provides a comprehensive overview of the global trends and intellectual evolution of XBRL adoption in financial reporting from 2000 to 2024. The findings reveal that XBRL research has progressed from early explorations of technical implementation and reporting standardization to more recent investigations into its impact on market efficiency, firm behavior, and regulatory compliance. Through co-authorship, country collaboration, and keyword analyses, the study identifies dominant research clusters, influential authors, and emerging themes such as information asymmetry, IFRS integration, and adoption challenges. While the United States and a few developed economies lead in scholarly output, there is growing interest from regions like Malaysia and Jordan, although research remains concentrated and fragmented. The study also highlights the increasing interdisciplinarity of XBRL research, intersecting accounting, information systems, and digital governance. These insights offer a valuable roadmap for future studies to explore underrepresented regions, integrate advanced technologies, and adopt broader theoretical frameworks to enrich the discourse on digital financial reporting.

REFERENCES

- J. Efendi, L. M. Smith, and J. Wong, "Longitudinal analysis of voluntary adoption of XBRL on financial reporting," Int. J. Econ. Account., vol. 2, no. 2, pp. 173–189, 2011.
- [2] F. Bartolacci, A. Caputo, A. Fradeani, and M. Soverchia, "Twenty years of XBRL: what we know and where we are going," *Meditari Account. Res.*, vol. 29, no. 5, pp. 1113–1145, 2021.
- [3] C. Liu, "XBRL: a new global paradigm for business financial reporting," *J. Glob. Inf. Manag.*, vol. 21, no. 3, pp. 60–80, 2013.
- [4] R. S. Debreceny *et al.*, "Financial Reporting in XBRL on the SEC's EDGAR System: A Critique and Evaluation," *J. Inf. Syst.*, vol. 19, no. 2, pp. 191–210, 2005.
- [5] T. Hsieh and J. C. Bedard, "Impact of XBRL on voluntary adopters' financial reporting quality and cost of equity capital," *J. Emerg. Technol. Account.*, vol. 15, no. 2, pp. 45–65, 2018.
- [6] M. Al-Okaily, H. Boshnak, H. Alkayed, E. Shehadeh, and M. Alqam, "From traditional to digital: the role of XBRL adoption in improving financial statements transparency," Glob. Knowledge, Mem. Commun., 2024.
- [7] M. De Martinis, M. Khedmati, F. Navissi, M. A. Sualihu, and Z. Tofik-Abu, "The role of agency costs in the voluntary adoption of XBRL-based financial reporting," *Int. J. Manag. Financ.*, vol. 16, no. 5, pp. 599–622, 2020.
- [8] H. Borgi, "XBRL technology adoption and consequences: A synthesis of theories and suggestions of future research," J. Account. Manag. Inf. Syst., vol. 21, no. 2, pp. 220–235, 2022.
- [9] R. Debreceny and G. L. Gray, "The production and use of semantically rich accounting reports on the Internet: XML and XBRL," *Int. J. Account. Inf. Syst.*, vol. 2, no. 1, pp. 47–74, 2001.
- [10] N. Donthu, S. Kumar, D. Mukherjee, N. Pandey, and W. M. Lim, "How to conduct a bibliometric analysis: An overview and guidelines," *J. Bus. Res.*, vol. 133, pp. 285–296, 2021.
- [11] N. Van Eck and L. Waltman, "Software survey: VOSviewer, a computer program for bibliometric mapping," *Scientometrics*, vol. 84, no. 2, pp. 523–538, 2010.
- [12] N. R. Mosteanu and A. Faccia, "Digital systems and new challenges of financial management–FinTech, XBRL, blockchain and cryptocurrencies," *Qual. to Success*, vol. 21, no. 174, pp. 159–166, 2020.
- [13] H. Yoon, H. Zo, and A. P. Ciganek, "Does XBRL adoption reduce information asymmetry?," *J. Bus. Res.*, vol. 64, no. 2, pp. 157–163, 2011.
- [14] E. Blankespoor, B. P. Miller, and H. D. White, "Initial evidence on the market impact of the XBRL mandate," *Rev. Account. Stud.*, vol. 19, no. 4, pp. 1468–1503, 2014.
- [15] R. Pinsker and S. Li, "Costs and benefits of XBRL adoption: Early evidence," Commun. ACM, vol. 51, no. 3, pp. 47–50, 2008.
- [16] D. Henderson, S. D. Sheetz, and B. S. Trinkle, "The determinants of inter-organizational and internal in-house adoption of XBRL: A structural equation model," *Int. J. Account. Inf. Syst.*, vol. 13, no. 2, pp. 109–140, 2012.
- [17] C. Liu, T. Wang, and L. J. Yao, "XBRL's impact on analyst forecast behavior: An empirical study," *J. Account. public policy*, vol. 33, no. 1, pp. 69–82, 2014.
- [18] Y. Dong, O. Z. Li, Y. Lin, and C. Ni, "Does information-processing cost affect firm-specific information acquisition? Evidence from XBRL adoption," *J. Financ. Quant. Anal.*, vol. 51, no. 2, pp. 435–462, 2016.
- [19] E. Bonsón, V. Cortijo, and T. Escobar, "Towards the global adoption of XBRL using International Financial Reporting Standards (IFRS)," *Int. J. Account. Inf. Syst.*, vol. 10, no. 1, pp. 46–60, 2009.
- [20] I. Troshani and B. Doolin, "Innovation diffusion: a stakeholder and social network view," Eur. J. Innov. Manag., vol. 10, no. 2, pp. 176–200, 2007.