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MERGERS AND ACQUISITIONS IN THE TECHNOLOGY INDUSTRY: A BIBLIOMETRIC ANALYSIS AND FUTURE RESEARCH AVENUES

FUSIONES Y ADQUISICIONES EN LA INDUSTRIA DE TECNOLOGÍA: ANÁLISIS BIBLIOMÉTRICO Y FUTURAS VÍAS DE INVESTIGACIÓN

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Abstract

The growth of research on business administration and management, the acceleration of technological change, and global processes of corporate consolidation have motivated this study on mergers and acquisitions in the technology industry. We perform bibliometric and content analysis of this topic using documents published in the Web of Science database. After refining the search based on the keywords selected and quality of the academic journals, we obtain 148 articles, from which we identify the main journals, countries, institutions, authors, and relevant articles to answer the research questions defined for this study. We also provide a keyword/cartographic analysis that identifies six main research streams. Finally, we summarize the main issues and questions for future research that emerge from the literature.

Keywords: mergers and acquisitions, technology, bibliometric review, content analysis.

JEL Codes: G34, M15

Resumen

El crecimiento de investigaciones en administración y dirección de empresas, la aceleración del cambio tecnológico y los procesos de consolidación empresarial a nivel global, han motivado la elaboración de este estudio sobre las fusiones y adquisiciones en la industria tecnológica. Con el propósito de contribuir a la revisión de la producción científica sobre fusiones y adquisiciones, el objetivo de esta investigación es realizar un análisis bibliométrico y de contenido sobre esta temática, a partir de documentos publicados en la base de datos *Web of Science*. Luego de refinar la búsqueda en función de las palabras clave seleccionadas, así como de la calidad de las revistas académicas, se obtuvieron 148 artículos, identificando las principales revistas, países, instituciones, autores, artículos relevantes y dimos respuesta a nuestras preguntas de investigación, que contribuyen en el tema estudiado. Asimismo, se aporta un análisis cartográfico de palabras clave que identifican seis corrientes principales de investigación. Finalmente, se resume las principales cuestiones, así como las preguntas sugeridas por la literatura para futuras investigaciones.

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Palabras clave: fusiones y adquisiciones, tecnología, revisión bibliométrica, análisis de contenido.
Códigos JEL: G34, M15

1. INTRODUCTION

Today's competitive environment is changing rapidly. Companies must reinvent to adapt to changing new technologies, as only so can they provide new products and services to a dynamic global market and satisfy the needs of increasingly demanding customers. Technological advances enable companies to respond quickly to competitors and innovate in their products or services to maintain competitive advantage. Because having only an organic growth strategy can make it difficult to achieve business growth objectives over time, companies also use mergers and acquisitions (hereafter, M&As) to expand their stock of resources and capabilities (Roberts & Liu, 2001; King et al., 2008).

In the last 20 years, the number of M&As has grown 33.9% globally (Statista Database), indicating a new wave of transactions across various industries, such as commodities, energy, manufacturing, services, and technology, among others. These transactions seek to acquire resources and capabilities well established in companies (Uhlenbruck et al., 2006).

According to the MarketLine database, 23,520 transactions were completed in the global technology industry in 2023, and, as of December 2023, seven of the largest companies in the world in terms of market capitalization were American technology companies. These same companies have performed several transactions in recent years.

MarketLine also shows that during 2013-2023 Microsoft Corp. made more than 205 deals, Apple Inc. more than 151, Nvidia Corp. more than 64, Alphabet Inc. more than 142, Amazon Inc. more than 149, Meta Platforms Inc. more than 76, and Broadcom Inc. more than 24. It is thus not surprising that, as of December 2023, these same companies were among the top 10 in the world in terms of market capitalization.

Technology companies are exploiting opportunities to acquire established companies or technology startups either for corporate restructuring or to achieve synergies, economies of scale, and new resources and capabilities. In so doing, they seek to maintain a competitive advantage or gain it more quickly. This trend has been influenced by new technology or new trends in technology, such as the Internet of Things, virtual reality, and digitalization processes, as well as artificial intelligence.

Over the years, scholars have conducted several literature review on this corporate strategy (i.e., Shimizu et al. (2004), Cartwright and Schoenberg (2006), Haleblian et al. (2009), Ferreira et al. (2014), Eulerich et al. (2022)). These reviews have focused on different topics related to M&As (value creation, M&A performance, cross-border transactions, culture, M&A process, integration, and innovation), as well as on industries other than the technology industry, such as the financial industry (Chiaramonte et al., 2023; Cumming et al., 2023).

Only a few studies have focused on high-tech industries. Meglio (2009), for example, conducts a literature review of performance measurement in M&As in the technology industry, and Rossi et al. (2013) reviews the literature on high-tech industry M&As that focus on the value creation process. Although scholars have reviewed the literature on M&As, few literature reviews or bibliometric analyses have focused on M&A in the technology industry.

It is important to perform bibliometric analysis of the dynamics and main determinants of or motivations for M&As in the technology industry. Whereas traditional literature reviews

focus on qualitative synthesis of a specific topic using narrative methods and subjective literature selection, bibliometric analysis applies quantitative methods, summarizes large quantities of bibliometric data to examine publication patterns, and provides objective metrics on academic production, article impact, co-authorship networks, thematic evolution over time, and emerging trends of a research topic (Donthu et al., 2021).

Our bibliometric analysis of M&As in the technology industry could identify emerging or yet uncovered lines of research, define the evolution of the literature over time, and identify relevant authors, their collaboration networks worldwide, and research trends on this topic. The perspective gained from such information complements existing knowledge on this type of transaction.

The results obtained could also be used to compare M&As in the technology industry to those in other industries. Comparison of volume of publications, evolution over time, and strategic approaches is valuable because the technology industry is more dynamic than other industries due to companies' need to innovate. Bibliometric analysis can reveal these issues in research trends.

Our literature review applied a combination of quantitative and qualitative methodologies (Khan et al., 2020; 2022) to answer the following three research questions:

- What are the influential aspects of the literature on M&As in the technology industry?
- What are the main clusters of the literature on M&As in the technology industry?
- What are the future research avenues based on the literature on M&As in the technology industry?

Our research aims to advance knowledge of M&As in the technology industry through two main contributions to the literature on this topic. First, it shows the state of research on the topic and provides relevant information such as systematic mapping of academic production on M&As in technology industry and highlights the most developed and influential themes.

Second, it identifies gaps in the literature and proposes new future research avenues for researchers who wish to understand the evolution and state of the art on M&As in the technology industry. Our analysis also has implications for managers, as exploring trends and the main motivations behind such M&As helps to minimize risks and improve M&A performance.

This article is organized as follows. The second section describes the methodology and data selection procedure. The third section presents the results obtained. The fourth describes the literature networks on M&As in the technology industry, and the fifth summarizes the future research avenues that emerge from our study. Finally, we present the conclusions of our research.

2. METHODOLOGY AND DATA COLLECTION

2.1. Methodology

Donthu et al. (2021) recommend complementing bibliometric observations with content analysis. Our review thus employed a combination of bibliometric (quantitative issues) and content analysis (qualitative issues). This methodology is widely used in the most recent literature on finance and business (Paltrinieri et al., 2019; Khan et al., 2020; Khan et al., 2022; Chiaramonte et al., 2023).

We conducted our analysis along the following five dimensions suggested by the studies cited above: bibliometric citation and co-citation analysis, bibliometric co-authorship analysis, keyword/cartography analysis, bibliographic coupling analysis, and content analysis.

We used two of the analytical tools best known to researchers who conduct bibliometric analyses: VOSviewer for visualizing networks (Van Eck & Waltman, 2010; Baker et al., 2020; Khan et al., 2020) and the Bibliometrix package of RStudio with Biblioshiny for content analysis (Aria & Cuccurullo, 2017).

2.2. Data selection

We used three steps to select our sample:

2.2.1. Step 1: Identification and selection of the database:

Web of Science (WoS) and Scopus are possibly the most complete and currently used databases of scholarly papers in the social sciences. We chose the WoS database because it serves as a perfect subset of Scopus (Waltman, 2016) and is the most important bibliometric database in this field (Cobo et al., 2015). It is also of higher quality (Li & Hale, 2016), used the most often, more reliable (Harzing & Alakangas, 2016), and not biased towards any individual publisher (Paltrinieri et al., 2019; Khan et al., 2020, 2022).

2.2.2. Step 2: Selection of relevant literature using appropriate keywords:

After choosing the database, we began the search for relevant literature using the best keywords, following a two-step process. First, we sought publications containing the keywords "mergers and acquisitions" and "technology" in the title or abstract. We then performed keyword analysis of the 620 articles obtained, using VOSviewer to identify the most frequently used keywords.

Subsequently, we performed a new search with the keywords identified, as follows: ("M&A" OR "Merger*" OR "mergers and acquisitions" OR "merger and acquisition" OR "mergers & acquisitions" OR "acquisition*") AND ("high-tech industr*" OR "high-tech firm*" OR "high-tech compan*" OR "high-tech startup*" OR "technology industr*" OR "technology firm*" OR "technology compan*" OR "tech startup*").

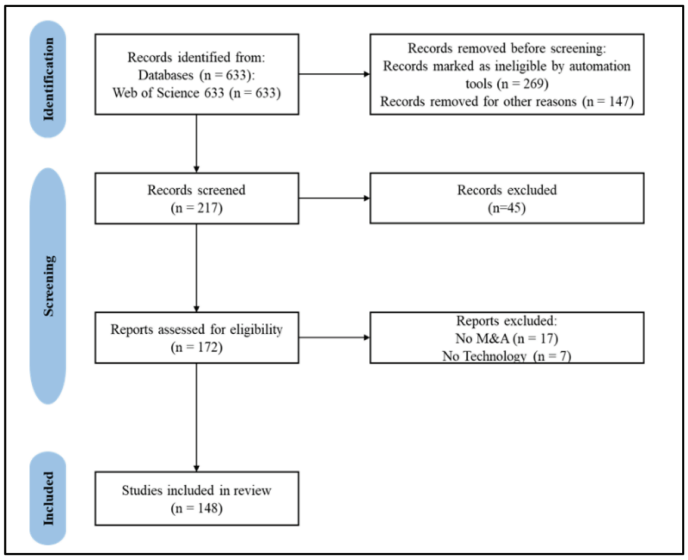
We obtained 633 publications that contained these keywords in the title or abstract within our search period, 2001-2022. (Articles published in 2023 were excluded due to the obvious citation limitation.) To obtain more relevant data, we applied the following filters: 1) database: Web of Science Core Collection; 2) type of publication: articles; 3) categories: management, business, economics, business, finance; 4) language: English. These filters reduced our sample to 217 articles.

2.2.3. Step 3: Examination of articles selected for final sample:

To ensure the quality of the publications, we restricted the previous sample of 217 articles to journals with an impact factor in the *Journal Citation Report* by Clarivate Analytics (JCR). This condition reduced our sample to 172 articles. Each article was reviewed to confirm its relevance, and we rejected articles in which M&A was a marginal component or that did not focus on the technology industry. This step produced the final sample of 148 articles.

Figure 1 represents the procedure our study followed to arrive at the final sample, which was established by applying the respective filters to the initial search for publications.

FIGURE 1. DATA COLLECTION FLOW DIAGRAM



Source: Own elaboration.

3. RESULTS AND ANALYSIS

3.1. Main characteristics of the literature

Table 1 presents the main information on the data collected. Our sample was composed of 148 articles published from 2001 to 2022 in 84 journals with a JCR impact factor. It shows an annual growth rate of 7.97% and articles written by 349 authors. We find 23 single-author articles. The rest of the articles have two or more co-authors. As this topic has 2.55 co-authors per document, with 33.11% international co-authorships, M&A research in the technology industry occurs mainly through collaboration.

TABLE 1. MAIN STRUCTURE OF THE DATA COLLECTED

Description	Results
Main information	
Timespan	2001-2022
Sources	84
Documents	148
Annual growth rate %	7.97
Document average age	10.6
Average citations per document	51.82
References	7,412
Document types	
Article	143

(continued)

TABLE 1. MAIN STRUCTURE OF THE DATA COLLECTED
(continued)

Description	Results
Article; early access	2
Article; proceedings paper	3
Document content	
Keywords plus	443
Author's keywords	517
Authors	
Authors	349
Authors of single-authored docs.	23
Authors collaboration	
Single-authored documents	26
Co-authors per document	2.55
International co-authorships %	33.11

Source: Own elaboration based on Biblioshiny.

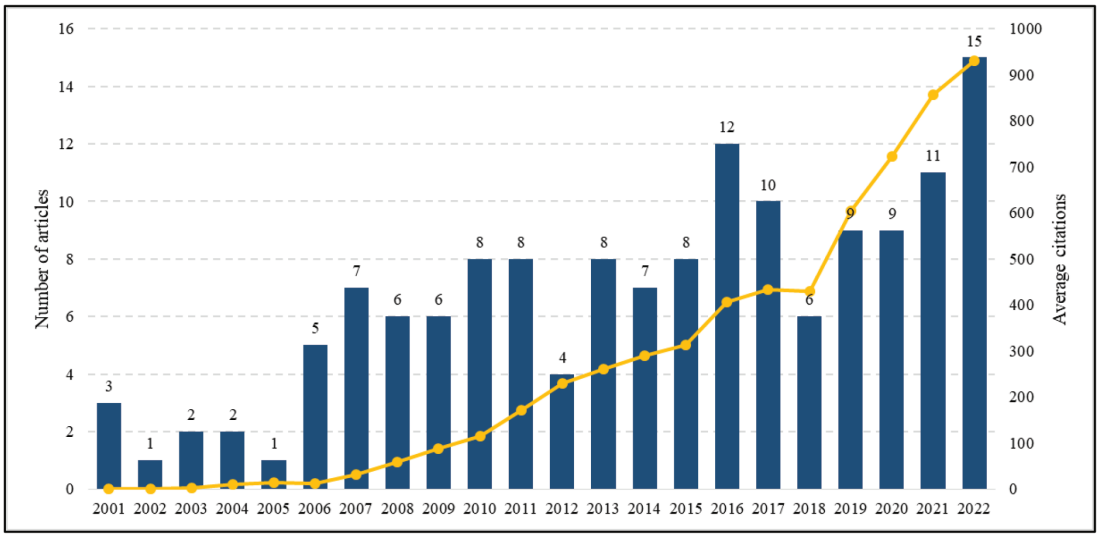
Figure 2 charts the distribution of articles and average citations on the timeline. We observe a drop in the years 2012 and 2018. The years with the highest citations are 2016 and 2022.

The average number of citations is approximately 52 per article and 7,412 references. These figures demonstrate constant interest in M&As in the technology industry. We identified 517 author keywords, and the databases generated 443 additional keywords.

3.2. Research categories

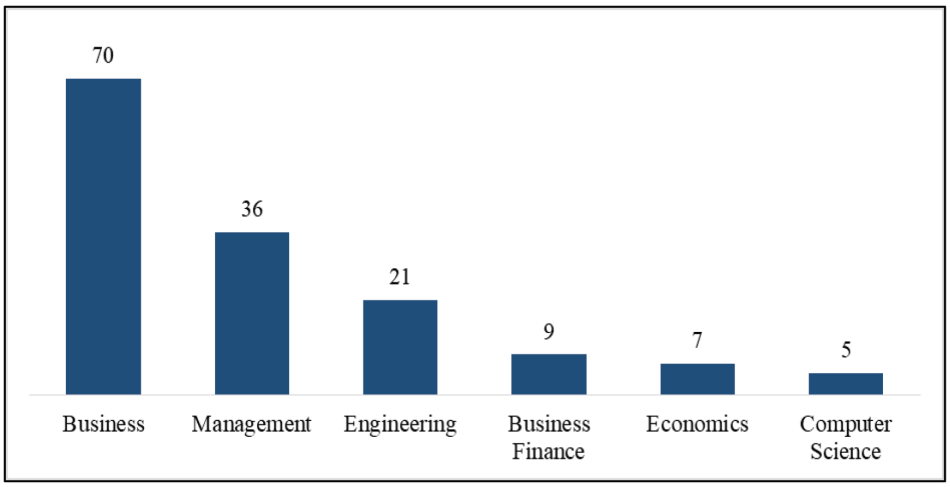
Figure 3 presents the distribution of the literature on M&As in the technology industry across 6 categories of the WoS database. We also find 26 articles registered outside the categories

FIGURE 2. NUMBER OF ARTICLES AND AVERAGE CITATIONS



Source: Own elaboration based on Biblioshiny.

FIGURE 3. WEB OF SCIENCE RESEARCH CATEGORIES



Source: Own elaboration based on Web of Science.

of Business or Management because this topic is also relevant to journals in the technology and operations sector, such as *Technovation* (Q1), *Knowledge Management Research & Practice* (Q1), *Journal of Technology Transfer* (Q2), and *International Journal of Technology Management* (Q2).

3.3. Main journals on M&As in the technology industry

Table 2 lists the top 10 research journals with the most articles published on M&As in the technology industry. The table also shows the portion of articles from each journal relative

TABLE 2. TOP 10 JOURNALS IN M&A LITERATURE IN THE TECHNOLOGY INDUSTRY

No.	Sources	Articles	% of sample	Publisher	I.F. 2022	WoS Category (JCR Quartile)
1	*Strategic Management Journal*	12	8%	Wiley	12.2	Business (Q1), Management (Q1)
2	*International Journal of Technology Management*	10	7%	Inderscience Enterprises Ltd.	2.5	Engineering, Multidisciplinary (Q2), Management (Q4)
3	*Research Policy*	9	6%	Elsevier	10.4	Management (Q1)

(continued)

TABLE 2. TOP 10 JOURNALS IN M&A LITERATURE IN THE TECHNOLOGY INDUSTRY *(continued)*

No.	Sources	Articles	% of sample	Publisher	I.F. 2022	WoS Category (JCR Quartile)
4	*Technological Forecasting and Social Change*	5	3%	Elsevier Science Inc.	12.0	Business (Q1), Regional & Urban Planning (Q1)
5	*Journal of Knowledge Management*	4	3%	Emerald Group Publishing Ltd.	8.8	Information Science & Library Science (Q1), Management (Q1)
6	*R&D Management*	4	3%	Wiley	6.5	Business (Q2), Management (Q2)
7	*IEEE Transactions on Engineering Management*	3	2%	IEEE-Inst Electrical Electronics Engineers Inc.	5.8	Business (Q2), Engineering, Industrial (Q2)
8	*International Business Review*	3	2%	Elsevier	8.4	Business (Q1)
9	*Journal of Business Research*	3	2%	Elsevier Science Inc.	11.5	Business (Q1)
10	*Journal of Management Studies*	3	2%	Wiley	10.7	Business (Q1), Management (Q1)

Source: Own elaboration.

to the total sample, the journals' impact factor in JCR, and the research category in the WoS database, including quartile classification in JCR.

The three journals with the most publications are *Strategic Management Journal* (12 articles), *International Journal of Technology Management* (10 articles) and *Research Policy* (9 articles). Within the top 10, 7 journals are in Q1 of the Business or Management categories in WoS.

3.4. Influential countries and institutions

Table 3 shows the most influential countries in academic production. The United States (USA) has produced 39 articles, followed by China and Germany with 29 and 10 articles, respectively. These countries represented 53% of our sample. Analysing of the total articles in the sample by major region shows that Europe accounts for 33%, the Americas for 32%, Asia for 30% and the Middle East for 5%. These figures demonstrate general interest in this research topic.

Table 4 presents the most influential institutions in research on M&As in the technology industry. Six institutions are from the USA, of which the University of Texas System and University System of Georgia publish the most articles.

TABLE 3. MOST INFLUENTIAL COUNTRIES BY CORRESPONDING AUTHOR

No.	Country	Articles	% of sample
1	USA	39	26%
2	China	29	20%
3	Germany	10	7%
4	United Kingdom	9	6%
5	Italy	8	5%
6	Canada	7	5%
7	Netherlands	6	4%
8	Korea	5	3%
9	Spain	5	3%
10	Israel	4	3%

Source: Own elaboration based on Biblioshiny.

TABLE 4. MOST INFLUENTIAL INSTITUTIONS ON M&AS IN THE TECHNOLOGY INDUSTRY LITERATURE (BY NUMBER OF ARTICLES)

No.	Institution	Articles	% of sample
1	University of Texas System	6	4%
2	University System of Georgia	6	4%
3	Tel Aviv University	5	3%
4	Georgia Institute of Technology	4	3%
5	Georgia State University	4	3%
6	Pennsylvania Commonwealth System of Higher Education	4	3%
7	Temple University	4	3%
8	Université de Strasbourg	4	3%
9	Universités de Strasbourg Établissements Associés	4	3%
10	University of Leeds	4	3%

Source: Own elaboration.

3.5. Influential authors on M&As in the technology industry

Table 5 displays the authors who have published the most articles on the topic, number of articles published in the period, average number of citations in each of their articles (TC/Articles), and some bibliometric indicators, such as total citations (TC), h-index, g-index and m-index.[2]

[2] The h-index indicates the total number of articles in which author "h" has been cited at least "h" times by others. The g-index is the largest number such that the top "g" articles are cited at least "g" times when the articles are sorted in decreasing order by number of citations. The m-index is defined as "h/n," where "h" is the author's g-index and "n" is the number of years since the author's first publication

TABLE 5. MOST INFLUENTIAL AUTHORS ON M&AS IN THE TECHNOLOGY INDUSTRY (BY NUMBER OF ARTICLES)

No.	Author	Institution	Country	Articles	F.P. year	h-index	g-index	m-index	TC	TC/ Articles
1	Wagner, Marcus	University of Wurzburg	Germany	5	2010	4	5	0.250	64	12.8
2	Lin, Bou-Wen	National Tsing Hua University	Taiwan	4	2007	4	4	0.211	133	33.3
3	Clegg, Jeremy	University of Leeds	United Kingdom	3	2014	3	3	0.250	44	14.7
4	Lee, Jongkuk	Ewha Womans University	South Korea	3	2016	3	3	0.300	43	14.3
5	Wei, Tian	Fudan University	China	3	2014	3	3	0.250	44	14.7
6	Zhu, Hong	Peking University	China	3	2015	3	3	0.273	161	53.7
7	Abetti, Pier A.	Lally School Management & Technology	USA	2	2013	2	2	0.154	9	4.5
8	Aghasi, Keivan	Polytechnic University of Milan	Italy	2	2017	2	2	0.222	22	11.0
9	Brueller, Nir N.	Tel Aviv University	Israel	2	2014	2	2	0.167	73	36.5
10	Carmeli, Abraham	University of London	United Kingdom	2	2014	2	2	0.167	73	36.5

Source: Own elaboration.

Marcus Wagner of the University of Wurzburg (Germany) is the most important author, with 5 articles, followed by Bou-Wen Lin of the National Tsing Hua University (Taiwan), with 4. Both authors have an aggregate total of 197 global citations in the period reviewed. Wagner (2010), on acquisitions of firms as a source of innovation and growth of technology-oriented firms, received a total of 64 global citations, while Lin, Chen and Wu (2007), on citation prediction of biotechnology patents, received a total of 133 global citations.

Table 6 displays the documents with the most global citations (total global citations (TGCs)). Zhou and Li (2012) demonstrate that the knowledge base supports integration when acquiring technology companies. Martens et al. (2007) show that entrepreneurial orientation and related resources impact the performance of technology firm acquisitions, while Makri

TABLE 6. MOST GLOBAL CITATION DOCUMENTS (BY TGC)

No.	Article	Journal	TGC	TGC/t	TLC	LC/GC Ratio (%)	TLC/t
1	Zhou and Li (2012)	*Strategic Management Journal*	740	53	5	0.68	0.36
2	Martens et al. (2007)	*Academy of Management Journal*	519	27	0	0.00	0.00
3	Makri et al. (2010)	*Strategic Management Journal*	494	31	19	3.85	1.19
4	Graebner (2004)	*Strategic Management Journal*	383	17	18	4.70	0.82
5	Lichtenthaler (2008)	*IEEE Transactions on Engineering Management*	377	21	0	0.00	0.00
6	Cloodt et al. (2006)	*Research Policy*	319	16	23	7.21	1.15
7	Schildt et al. (2005)	*Entrepreneurship Theory and Practice*	239	11	2	0.84	0.10
8	Grigoriou and Rothaermel (2017)	*Strategic Management Journal*	208	23	1	0.48	0.11
9	Leiponen (2008)	*Management Science*	182	10	0	0.00	0.00
10	Nguyen et al. (2015)	*Industrial Marketing Management*	179	16	0	0.00	0.00

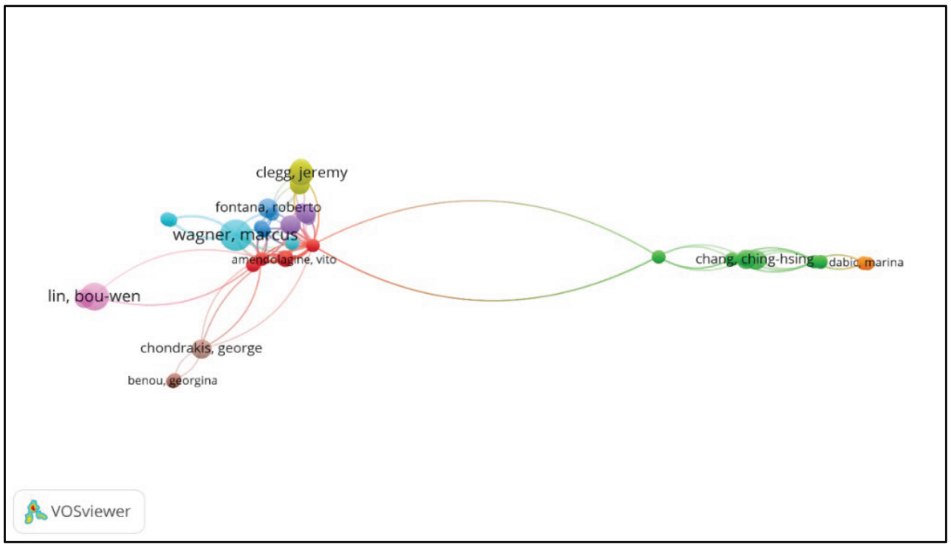
Source: Own elaboration.
Note: total global cites (TGC), number of years since of publication article (t), average global cites per year (TGC/t), total local cites (TLC), local cites/global cites (LC/GC), average local cites per year (TLC/t).

et al. (2010) analyze complementary technology, related knowledge, and the results of M&A innovation in the high-tech industry.

We use VOSviewer to visualize the citation networks. Figures 4-6 represent the citation network by authors (Figure 4), documents (Figure 5), and countries (Figure 6).

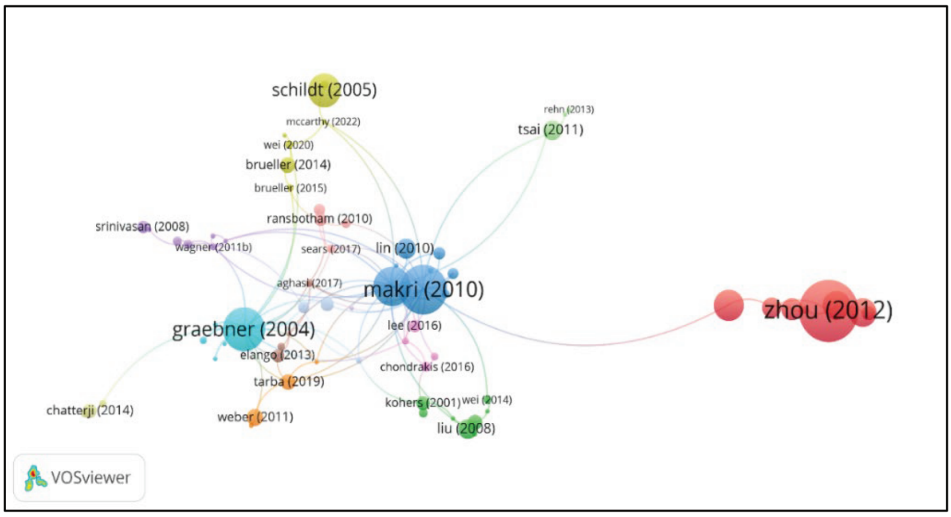
Figure 6 presents the citation network by countries cited, including countries with at least 5 documents and a minimum of 30 citations. We thus identify 4 clusters: cluster 1 (red), composed of USA, China, England, Taiwan, and Israel; cluster 2 (green), composed of the

FIGURE 4. CITATION NETWORK BY AUTHORS



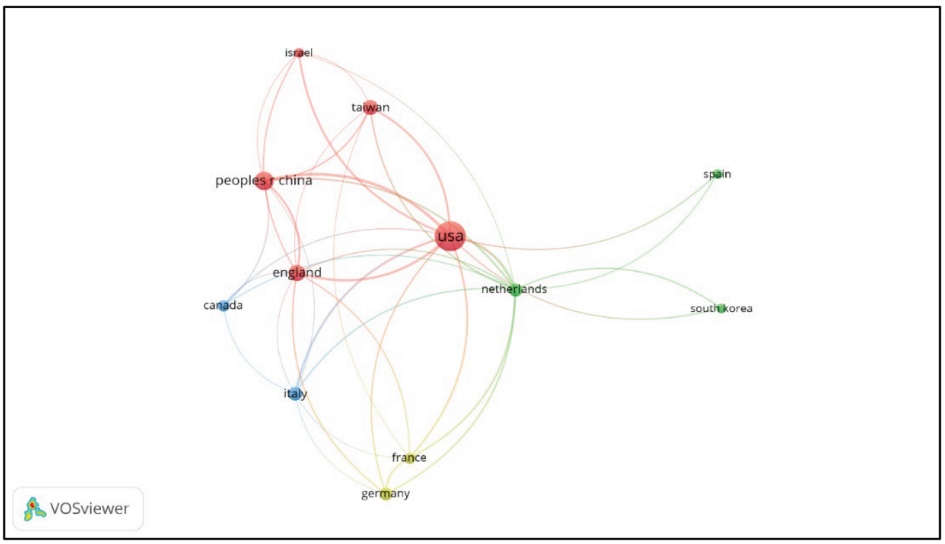
Source: Own elaboration based on VOSviewer.

FIGURE 5. CITATION NETWORK BY DOCUMENTS



Source: Own elaboration based on VOSviewer.

FIGURE 6. CITATION NETWORK BY COUNTRIES



Source: Own elaboration based on VOSviewer.

Netherlands, Spain, and South Korea; cluster 3 (blue), composed of Canada and Italy; and cluster 4 (yellow), composed of France and Germany.

3.6. Trending articles on M&As in the technology industry

Research trends are influenced by the most-cited articles on a specific topic. To analyze the articles trending on M&As in the technology industry, we thus analyze the total number of citations of these articles. To do so using our sample, we set a minimum of 50 citations to enable the software used to establish a ranking of the articles with the most citations overall. Table 7 lists the top 10 articles based on TGCs.

TABLE 7. TRENDING ARTICLES ON M&AS IN THE TECHNOLOGY INDUSTRY (BY TGCS)

No.	Article	Institution	Country	Journal	TGC	TC per year
1	Zhou and Li (2012)	University of Hong Kong	Hong Kong	*Strategic Management Journal*	740	53
2	Martens et al. (2007)	Concordia University	Canada	*Academy of Management Journal*	519	27
3	Makri et al. (2010)	University of Miami	USA	*Strategic Management Journal*	494	31

(continued)

TABLE 7. TRENDING ARTICLES ON M&AS IN THE TECHNOLOGY INDUSTRY (BY TGCS) *(continued)*

No.	Article	Institution	Country	Journal	TGC	TC per year
4	Graebner (2004)	University of Texas, Austin	USA	*Strategic Management Journal*	383	17
5	Lichtenthaler (2008)	WHU Otto Beisheim School of Management	Germany	*IEEE Transactions on Engineering Management*	377	21
6	Cloodt et al. (2006)	Eindhoven University of Technology	Netherlands	*Research Policy*	319	16
7	Schildt et al. (2005)	Helsinki University of Technology	Finland	*Entrepreneurship Theory and Practice*	239	11
8	Grigoriou and Rothaermel (2017)	Florida International University	USA	*Strategic Management Journal*	208	23
9	Leiponen (2008)	Cornell University	USA	*Management Science*	182	10
10	Nguyen et al. (2015)	East China University of Science & Technology	China	*Industrial Marketing Management*	179	16

Source: Own elaboration.

The top 10 publications relative to TGCs show a correlation between quality of the journal and number of citations received. Most of the top 10 publications are in journals with a JCR impact factor in quartiles 1 and 2. This result shows that the articles with the highest number of citations constitute a research trend and are published in top-quality journals in the academic field.

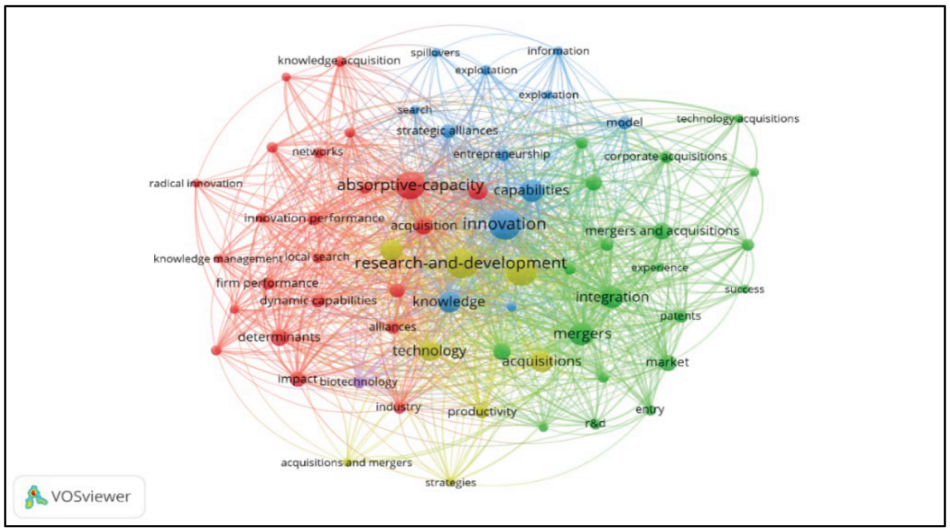
4. NETWORK VISUALIZATION OF THE LITERATURE

4.1. Keywords/Cartographic and trend analysis

We found 883 total keywords in our sample. To perform the cartographic analysis with VOSviewer software, we set a threshold of a minimum of 5 occurrences for each keyword. A total of 64 keywords met this condition, with a total link strength of 4,710.

Figure 7 shows that "research & development," "innovation," "absorptive capacity," "performance," and "mergers" are the 5 most frequent keywords. They constitute a trend in the literature on M&As in the technology industry. These trends can be seen in studies such as Miyazaki (2009), which proposes a positive association between R&D and M&A in Japanese high-tech industries; Liu and Zou (2008), which analyzes the impact of new foreign direct investment and M&As on innovation in Chinese high-tech firms; Duchek (2015), on enhancing absorptive capacity for innovation and change; Zhu and Qian (2015), on the performance of

FIGURE 7. VISUALIZATION OF TOTAL KEYWORD CO-OCCURRENCE NETWORK



Source: Own elaboration based on VOSviewer.
Note: Total keyword network analyses in literature on M&As in the technology industry (VOSviewer). Each total indicates keywords with at least 5 occurrences.

overseas acquisitions of high-tech firms; and Zhou et al. (2018), on the drivers of Chinese buyers that conduct M&As in the technology industry. These studies provide a sample of research trends.

We also observe trends that focus on open innovation (Wang et al., 2020; Wang et al., 2020; Chen et al., 2020; Li et al., 2022; Thneibat et al., 2022), startup acquisition (Kim, 2022; Liu et al., 2022), integration (Wei & Clegg, 2020; Yang & Ai, 2021; Lin & Ho, 2021; Lee & Lee, 2022), and knowledge acquisition (Gao, 2021; Adams et al., 2022).

Figure 8 shows 12 author keywords, grouped into 4 clusters: cluster 1 ("acquisition," "innovation performance," "knowledge acquisition," "open innovation"), cluster 2 ("innovation," "mergers and acquisitions," "patents," "R&D"), cluster 3 ("acquisitions," "entrepreneurship"), and cluster 4 ("acquisitions and mergers," "technology"). The keywords with the highest relevance in terms of total linkage strength were: "innovation," "mergers and acquisitions," "R&D," "technology," "acquisition," "patents" and "entrepreneurship."

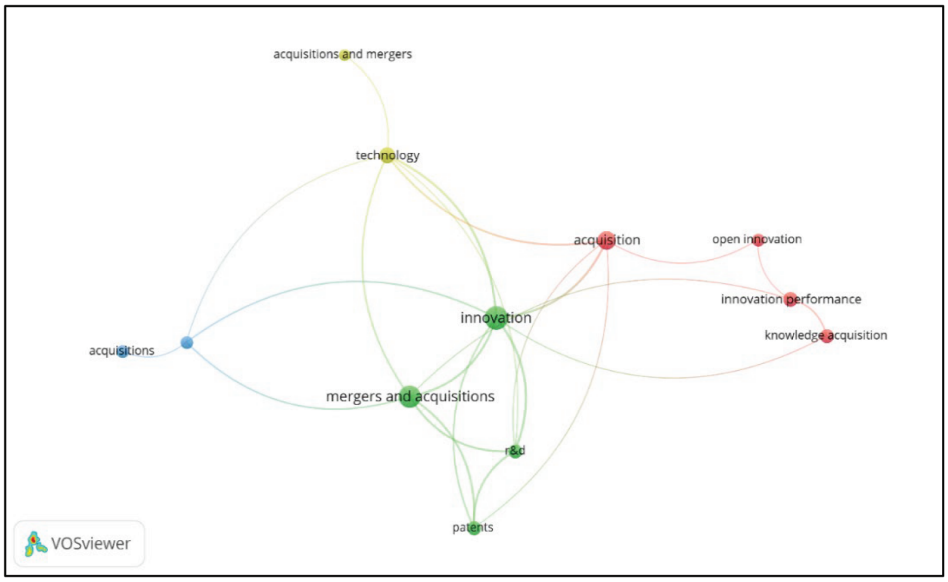
Reviewing the total link strength of the keywords listed above, we find that M&As in the technology industry are performed primarily to implement innovation processes, conduct open innovation, improve results, and acquire knowledge. M&As are also performed to access patents, R&D, and technology.

4.2. Thematic map of M&As in the technology industry

To understand the evolution of our research topic, we performed thematic analysis using RStudio's Biblioshiny tool to visualize the conceptual structure, starting from the author keywords and using the following parameters: minimum frequency of keywords, 10; number of keywords included in the analysis, 50; and number of tags for each group, 3.

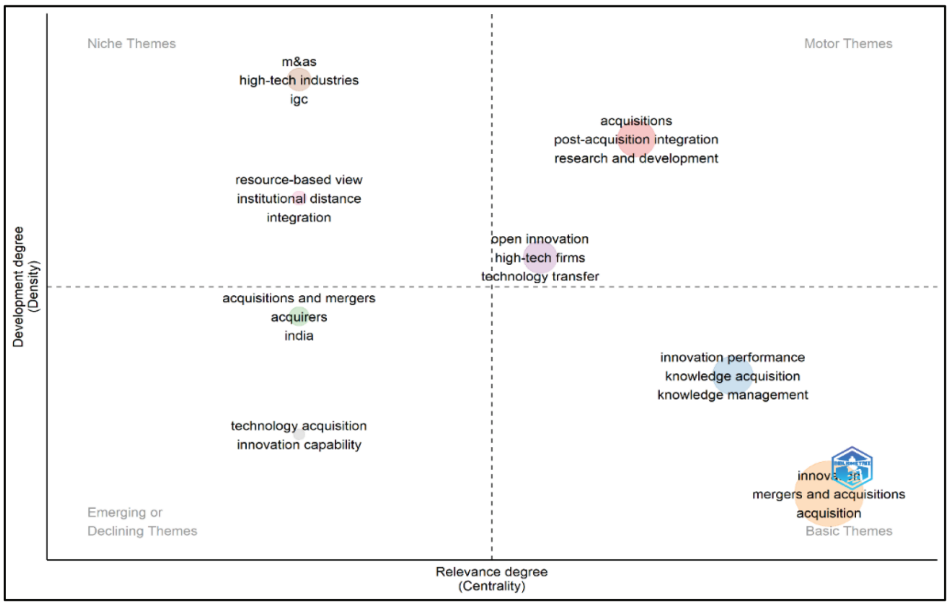
Figure 9 presents the thematic map, subdivided into four quadrants. The first quadrant (top right) represents the motor themes. These are highly developed and fundamental to the

FIGURE 8. VISUALIZATION OF AUTHOR KEYWORD CO-OCCURRENCE NETWORK



Source: Own elaboration based on VOSviewer.
Note: Author keyword network analysis in the literature on M&As in the technology industry, using VOSviewer. Each author keyword has at least 5 occurrences.

FIGURE 9. THEMATIC MAP OF M&AS IN THE TECHNOLOGY INDUSTRY



Source: Own elaboration based on Biblioshiny.

research topic. The second (top left) shows well-developed but marginal themes. The third (bottom left) shows emerging or declining themes. The fourth (bottom right) shows basic or fundamental but poorly developed themes. This map shows two clusters that are motor themes, with topics such as "acquisitions," "post-acquisition," "R&D," "open innovation," "high-tech companies," and "technology transfer." Our findings thus provide insight into why companies acquire technology firms, as well as the need for proper post-acquisition.

As niche themes, we find two clusters with the topics "mergers and acquisitions," "high-tech industry," "resource-based view," "institutional distance," and "integration." We thus detect a thematic focus on integration of acquired resources into the acquiring company.

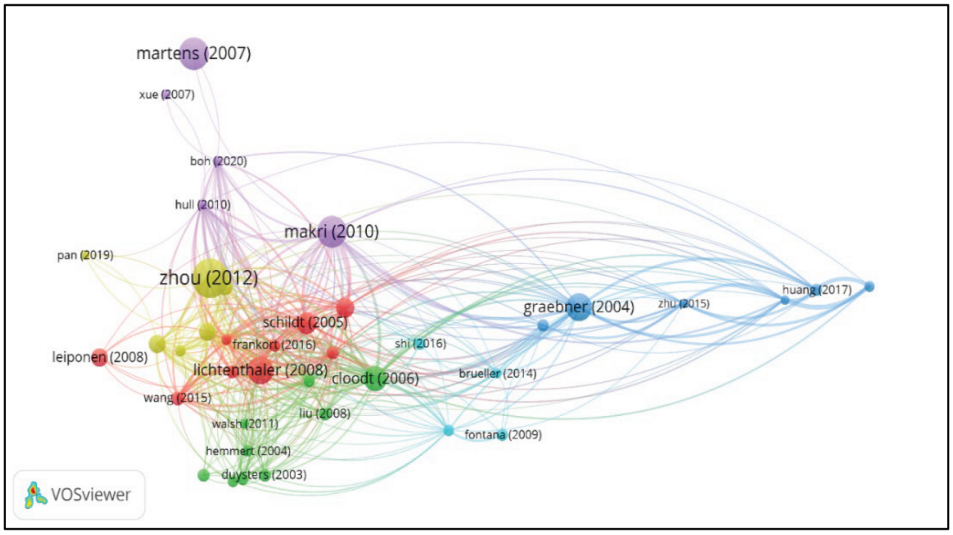
Emerging themes show two clusters with topics such as "acquisitions and mergers," "acquirers," "India," "technology acquisition," and "innovation capability." This quadrant focuses on M&As and innovation capabilities to leverage in technology acquisitions.

The basic themes also form two clusters, with topics such as "innovation performance," "knowledge acquisition," "knowledge management," "innovation," "mergers and acquisitions," and "acquisition." The thematic focus is on knowledge acquisition, management, and innovation performance measurement, which thus constitute basic themes that are fundamental but remain underdeveloped in the topic.

4.3. Bibliographic coupling and content analysis

The goal of bibliographic coupling is to explain the dimensions and trends in the literature in a research field. Figure 10 presents the results of our bibliographic coupling analysis using VOSviewer. To analyze these dimensions, we use different colors to differentiate the dimensions in the literature on M&As in the technology industry.

FIGURE 10. RESEARCH TREND NETWORK ON M&AS IN THE TECHNOLOGY INDUSTRY



Source: Own elaboration based on VOSviewer.
Note: Bibliographic network analysis (author, year) and identification of 6 clusters on research trends. Each publication has at least 50 citations.

Applying the threshold of at least 50 citations per article to our sample of 148 articles, we identified 39 articles that meet the condition specified above and 6 clusters that mark research trends.

The first cluster (red) is composed of 9 articles, which treat the increase in R&D and open innovation networks. The second (green) is composed of 9 articles on drivers and impact on the technology industry. The third (blue) is composed of 6 articles about integration of resources acquired in M&As. The fourth cluster (yellow) is composed of 6 articles that focus mainly on M&As in the technology industry to acquire new knowledge-based resources. The fifth (purple) is composed of 5 articles on drivers that improve M&A integration in the technology industry. Finally, the sixth cluster (light blue) is composed of 4 articles on internal capabilities that impact M&A performance in the technology industry. We see that M&As in the technology industry have different motivations that drive the research trends on this topic. We will now review each of these trends and perform content analysis of them.

4.3.1. Trend 1: M&As in the technology industry for R&D network and open innovation

The first cluster (red) is composed of 9 articles. This trend focuses on M&A drivers and their impact on the technology industry. Such drivers include the technology companies' acquisitions to access patents (Schildt et al., 2005) or increased knowledge (Lichtenthaler, 2008; Vasudeva et al., 2013; Wang et al., 2015), desire to improve the R&D network and capabilities within the company (Leiponen, 2008; Lin & Wu, 2010; Frankort, 2016), desire to perform open innovation (Wang et al., 2020), and desire to acquire external knowledge and develop internal knowledge (Grigoriou & Rothaermel, 2017).

Analyzing R&D alliances in the technology industry, Frankort (2016) suggests that firms that use such alliances to acquire knowledge obtain positive effects on their new product development, either when the firms and their partners are active in similar technology industries or when they operate in different product markets. Grigoriou and Rothaermel (2017) suggest that a firm's success in developing knowledge using external knowledge sources depends on the acquiring firm's internal knowledge, thus noting the importance of internal R&D and related prior knowledge. Such external knowledge enables firms to complement the internal knowledge that influences a firm's ability to benefit from greater openness to external knowledge and improve innovation performance (Wang et al., 2020).

4.3.2. Trend 2: M&A drivers and impact on the technology industry

The second cluster (green) is composed of 9 articles on the impact of acquiring firms in the high-tech industry (Jin & von Zedtwitz, 2008) on innovation (Duysters & De Man, 2003; Cloodt et al., 2006; Guan et al., 2006; Liu & Zou, 2008; Tsai et al., 2011), access to new technology (Hemmert, 2004; Chen, 2009), and innovation capabilities (Walsh & Linton, 2011).

In the last two decades, M&As in the technology industry have increased due to advances in information and telecommunications technology, which have represented additional value for high-tech firms (Cummins & Xie, 2008). Technology enables companies both to improve administrative efficiency and to achieve economies of scale through consolidation. Emprirical evidence suggests that R&D impacts acquisition of technology firms (Jin & von Zedtwitz, 2008), that technology transfer impacts innovation (Duysters & De Man, 2003; Cloodt et al., 2006; Guan et al., 2006; Liu & Zou, 2008; Tsai et al., 2011), that external technology acquisition and firm age have a positive impact on product innovation, and that R&D investment increases the effect of external technology acquisition on product innovation (Walsh & Linton, 2011; Tsai et al., 2011).

4.3.3. Trend 3: Integration of resources acquired in M&As in the technology industry

The third cluster (blue) is composed of 6 articles on complementary resources (Graebner, 2004), post-acquisition integration (Weber & Tarba, 2011; Zhu et al., 2015; Huang et al., 2017; Tarba et al., 2019), and the influence on acquisition performance of acquiring less control in a technology firm in an emerging market (De Beule et al., 2014).

Graebner (2004) suggests that technology acquisition firms provide complementary resources for exploitation and exploration for organizational survival. Once the companies and their resources have been acquired, these new resources must be integrated into the acquiring company. This implementation is thus a key aspect of successful acquisitions. In examining cultural issues in integration of high-tech companies, Weber and Tarba (2011) propose a comprehensive approach before, during, and after the process of integrating companies, since the culture of the acquired organization is often different from that of the acquiring company.

Analyzing cross-border acquisitions in the technology industry, Zhu et al. (2015) suggest that post-acquisition autonomy is the most important factor in value creation. The differences in power, distance, and value between the acquiring and target firms also affect acquirers' long-term performance after the acquisition (Huang et al., 2017). Further, in studying the factors that influence the performance of high-tech firm acquisitions, Tarba et al. (2019) argue that the potential for synergies between the acquired and acquiring firms, post-acquisition integration effectiveness, and organizational cultural differences positively influence the performance of high-tech firm acquisitions.

4.3.4. Trend 4: M&As in the technology industry to acquire new knowledge-based resources

The fourth cluster (yellow) is composed of 6 articles, mainly on technology firms' acquisitions to gain knowledge (Nguyen et al., 2015), the positive relationships of absorptive capacity to innovation (Xie et al., 2018; Pan et al., 2019), ways social capital helps integration in the acquisition of high-tech firms (Ramadan et al., 2017), ways entrepreneurial orientation and similar resources impact technology firm acquisition performance (Hughes et al., 2007), and ways the knowledge base helps integration in technology firm acquisition (Zhou & Li, 2012).

Companies need some internal capabilities to integrate new knowledge and then start the innovation process. As these capabilities include learning and absorptive capacity to acquire new knowledge-based resources and skills (Hull & Covin, 2010), it is not surprising that the four dimensions of absorptive capacity (knowledge acquisition, assimilation, transformation, and exploitation) have a positive relationship to firms' innovative performance (Xie et al., 2018). Zhou and Li (2012) also propose that a firm with a broad knowledge base is more likely to achieve radical innovation by sharing internal knowledge than by acquiring it from the market, whereas a firm with a deep knowledge base is more able to develop radical innovation by acquiring knowledge from the market than by sharing internal knowledge.

4.3.5. Trend 5: Drivers that improve M&A integration in the technology industry

The fifth cluster (purple) is composed of 5 articles on how entrepreneurial orientation and similar resources influence technology firms' acquisition performance (Martens et al., 2007), the relationship of R&D and its impact on acquisition of firms in the high-tech industry (Xue, 2007), access to new or related prior knowledge (Makri et al., 2010), the positive relationship

of absorptive capacity to innovation (Hull & Covin, 2010), and this relationship's influence on innovation (Boh et al., 2020).

Acquisitions of technology firms can occur at any point in the life cycle of a firm, whether it is a start-up, a growth firm, or a mature firm. Martens et al. (2007) analyzed entrepreneurs in semiconductor, biotechnology, and Internet firms, as well as IPOs in these industries. They argue that storytelling is a key mechanism by which entrepreneurs leverage existing capital to acquire additional resources. Similarly, Xue (2007) suggests that firms acquire new technologies through either internal R&D or acquisitions of firms, the latter enabling them to reduce the time needed to incorporate these new technologies.

Our analysis shows that M&As enable firms to incorporate new resources to maintain their market position, as well as to take advantage of new knowledge. Knowledge similarities also facilitate incremental firm renewal, contribute to post-merger performance (Makri et al., 2010), and start innovation processes when high levels of technological parity in the industry are accompanied by high levels of firm learning (Hull & Covin, 2010). Another way to improve innovation performance is to involve corporate investors in ownership of the firm, as they have extensive experience and reinforce the firm's view of its environment (Boh et al., 2020).

4.3.6. Trend 6: Internal capabilities that impact M&A performance in the technology industry

The sixth trend (light blue) is composed of 4 articles on how strategic agility in M&A fosters innovation; how external knowledge acquired in M&As influences innovation competencies (Fontana & Nesta, 2009), innovation capabilities (Cefis & Marsili, 2011) to leverage M&A in the technology industry, and organizational agility (Brueller et al., 2014); and how firms are acquired for business proximity or information systems (Shi et al., 2016).

In analyzing the relationship between product innovation and survival of high-tech firms, Fontana and Nesta (2009) suggest that acquisitions are used to acquire new knowledge, innovative assets, and R&D efforts to increase probability of survival. Companies also need radical innovation capabilities that enable them to respond quickly to the market (Cefis & Marsili, 2011), but companies that perform M&As need organizational capabilities to change and adapt to the new landscape (Brueller et al., 2014), where the similarity and complementarity of the intervening firms will positively influences M&A performance (Shi et al., 2016).

5. FUTURE RESEARCH AVENUES

The bibliographic coupling and content analysis allows us to identify some gaps in the literature on our research topic.

5.1. M&As in the technology industry for R&D network and open innovation

Frankort (2016) suggests that the network of R&D alliances has a positive influence on new product development, whether the companies are in similar technological industries or in industries with different products. More research is needed, however, on the capabilities of technology firms in the market-product relationship and the influence of absorptive capacity in this context. In this vein, Grigoriou and Rothaermel (2017) note the importance of internal firm knowledge in developing new knowledge based on knowledge from external sources. Future research could also investigate measures that capture the costs and benefits of a knowledge acquisition strategy, as well as a measure of formal and informal knowledge generation. Although other studies

analyze ambidextrous organizations (Wang et al., 2020), the field must also investigate the role of absorptive capacity in the acquisition of firms that adopt this strategy and the knowledge-seeking approach that best enables firms to perform innovative activities efficiently.

5.2. M&A drivers and impact on the technology industry

Since companies must seize opportunities to achieve their strategic plans, they need a variety of competencies to achieve their goals. Walsh and Linton (2011) propose that technology firms need a set of competencies to use across a range of products to gain an advantage over their competitors. Future research could, however, focus on identifying which competencies are needed to implement technological change or innovation processes.

5.3. Integration of resources acquired in M&As in the technology industry

Integration of acquired resources is a key element for better M&A performance. Zhu et al. (2015) argue that technology firms' post-acquisition autonomy is the most important factor in value creation. The role of institutional distance in cross-border M&As and its effect on the performance of technology firms also requires further exploration. For Huang et al. (2017), the power distance between the intervening firms in an M&A may affect long-term performance of the acquiring firms. Future research could thus investigate how asymmetry of national and organizational culture affects the performance of an M&A in the technology industry. Further, while Tarba et al. (2019) establish a positive relationship between the synergies of the firms performing an M&A, integration effectiveness, and organizational cultural differences, future research could analyze the impact of integration speed and level of autonomy of the firm acquired from the technology industry.

5.4. M&As in the technology industry to acquire new knowledge-based resources

Xie et al.'s (2018) analysis of the relationship between absorptive capacity and innovation performance in Chinese high-tech firms confirms a positive relationship between absorptive capacity and innovative performance of firms. Further study must, however, deepen knowledge of the factors of firm acquisition that influence this relationship, while also determining whether these results are similar in other industries and countries.

5.5. Drivers that improve M&A integration in the technology industry

Boh et al. (2020) affirm that corporate investor experience improves innovation performance in acquired technology firms, but their research only covers Taiwan's high-tech industry. Future research could study other markets, such as European or American markets, as well as the ways the experiences of corporate and family investors impact innovation performance in other markets.

5.6. Internal capabilities that impact M&A performance in the technology industry

Analyzing the differences between platform acquisitions and add-on acquisitions in the high-tech industry, Brueller et al. (2014) find that these acquisitions enhance strategic agility, as acquisitions may facilitate accumulation of capabilities underlying strategic agility. Still, future research could analyze openness of the organizational culture in M&As and the capabilities needed to manage change and adaptation for better M&A performance.

Based on the foregoing, Table 8 presents future research questions for understanding M&As in the technology industry.

TABLE 8. FUTURE RESEARCH QUESTIONS

Research stream	Question	Future research questions	Source
M&As in the technology industry for R&D networks and open innovation	1	What internal capabilities does the acquired technology company need in the product-market relationship?	Frankort (2016)
	2	What kind of metrics can capture the benefits and costs of an external knowledge acquisition strategy versus internal knowledge networks?	Grigoriou and Rothaermel (2017)
	3	What is the role of absorptive capacity in the acquisition of firms that use an ambidextrous knowledge strategy, and how does this strategy affect innovation performance?	Wang et al. (2020)
M&A drivers and impact on the technology industry	4	What competencies are needed to carry out technological change or innovation processes?	Walsh et al. (2011)
Integration of resources acquired in M&As in the technology industry	5	What is the role of institutional distance (economic, regulatory, and political) in a cross-border M&A in the technology industry?	Zhu et al. (2015)
	6	How does the nature of knowledge influence technology companies' cross-border M&A performance?	Author's suggestion
	7	How does asymmetry of the national and organizational culture affect the performance of high-tech mergers?	Huang et al. (2017)
	8	What is the impact of integration speed on the success of M&As in the technology industry compared to other industries?	Tarba et al. (2019)
	9	How does foreign ownership influence post-acquisition of a technology company?	Author's suggestion
M&As in the technology industry to acquire new knowledge-based resources	10	What factors in the acquisition of companies can affect the relationship between absorptive capacity and the company's innovation performance?	Xie et al. (2018)
Drivers that improve M&A integration in the technology industry	11	How can the experience of corporate and family investors impact innovation performance in other markets?	Boh et al. (2020)
Internal capabilities that impact M&A performance in the technology industry	12	What capabilities are needed to manage change and adaptation to improve M&A performance?	Brueller et al. (2014)

Source: Own elaboration.

6. CONCLUSION

We have applied the bibliometric methodology to conduct bibliometric and then a content analysis of the literature on M&As in the technology industry. We identified 148 articles with 349 authors in our period of analysis (2001-2022). We also observed the growth of the academic literature on the subject, the most relevant of which occurs in journals (*Strategic Management Journal,* with 12 articles, and *International Journal of Technology Management,* with 10 articles), countries (the United States and China, with 39 and 29 articles respectively), institutions (University of Texas System and the University System of Georgia, with 6 articles each), authors (Marcus Wagner of the University of Wurzburg and Bou-Wen Lin of the National Tsing Hua University, with 5 and 4 articles each), and trending articles (Zhou & Li, 2012; Martens et al., 2007).

We found that the literature on M&As in the technology industry focuses on the need for internal capabilities in companies. These capabilities include absorptive capacity, R&D development for open innovation, acquisition of companies to access patents, analysis of startup acquisitions for technology transfer, cross-border M&A to acquire knowledge, and the problems of business integration. We also conducted content analysis to identify any possible research trend(s) on the subject. We identified 39 relevant articles in this topic, in 6 clusters that refer to the research trend on M&As in the technology industry: 1) M&A in the technology industry for R&D network and open innovation, 2) M&A drivers and impact on the technology industry, 3) integration of resources acquired in M&As in the technology industry, 4) M&As in the technology industry to acquire new knowledge-based resources, 5) drivers that improve M&A integration in the technology industry, and 6) internal capabilities that impact M&A performance in the technology industry.

Our research aims to contribute to the literature analyzing the state of the art on M&As in the technology industry. We also identify the main topics covered in the existing literature, as well as the evolution of the subject matter over time. Our content analysis enables us to identify research trends, identify some gaps in the literature on our topic, and propose future research questions.

Our study also has managerial implications, as it shows executives and investors M&A trends in the technology industry. We explore the main motivations behind these M&As, such as integration of R&D networks, access to patents, technology transfer through acquisition of start-ups, and knowledge acquisition to initiate innovation processes. Understanding these motivations will enable managers to strengthen their technology companies' internal capabilities, thus improving M&A performance in the technology companies.

Our research has some limitations, but they represent opportunities to improve this type of research. We may have missed high-quality publications due to two factors. The first is the period of analysis, 2001-2022. Second, our citation analysis and bibliographic coupling included a minimum threshold of citations to obtain a significant result, making it possible that we missed a high-quality paper because it had fewer citations than the threshold. This possible omission provides an opportunity to deepen bibliometric and content analysis. Future research could extend the timespan and apply a lower citation threshold to include more publications. Although our bibliometric analysis is complemented by content analysis, future research could further complement this study with a qualitative approach (case study) to explore the topic in greater depth and analyze the trends highlighted in our research. Another limitation of the study is our decision to analyze the WoS-Core Collection database. Although this database is of high quality (Li & Hale, 2016) and has been used in previous studies, it does not contain all academic publications (Waltman, 2016). Future research could thus include other databases to enable further analysis of the topic.

Finally, we identify research trends in M&As in the technology industry and possible future research avenues on the topic. In proposing future research questions on the subject. We give other researchers the opportunity to overcome the limitations of this bibliometric analysis.

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REFERENCES

Adams, P., Fontana, R., & Malerba, F. (2022). Knowledge resources and the acquisition of spinouts. *Eurasian Business Review*, *12*(2), 277–313. https://doi.org/10.1007/s40821-021-00198-6

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, *11*(4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007

Baker, H. K., Kumar, S., & Pandey, N. (2020). A bibliometric analysis of European Financial Management's first 25 years. *European Financial Management*, *26*(5), 1224–1260. https://doi.org/10.1111/eufm.12286

Boh, W. F., Huang, C. J., & Wu, A. (2020). Investor experience and innovation performance: The mediating role of external cooperation. *Strategic Management Journal*, *41*(1), 124–151. https://doi.org/10.1002/smj.3089

Brueller, N. N., Carmeli, A., & Drori, I. (2014). How do different types of mergers and acquisitions facilitate strategic agility? *California Management Review*, *56*(September), 39–57. https://doi.org/10.1525/cmr.2014.56.3.39

Cartwright, S., & Schoenberg, R. (2006). Thirty years of mergers and acquisitions research: Recent advances and futures opportunities. *British Journal of Management*, *17*(51), 51–55. https://doi.org/10.1111/j.1467-8551.2006.00475.x

Cefis, E., & Marsili, O. (2011). Born to flip. Exit decisions of entrepreneurial firms in high-tech and low-tech industries. *Journal of Evolutionary Economics*, *21*(3), 473–498. https://doi.org/10.1007/s00191-010-0210-4

Chen, I. J., Hsu, P. H., Officer, M. S., & Wang, Y. (2020). The Oscar goes to…: High-tech firms' acquisitions in response to rivals' technology breakthroughs. *Research Policy*, *49*(7), 1–20. https://doi.org/10.1016/j.respol.2020.104078

Chen, L. C. (2009). Learning through informal local and global linkages: The case of Taiwan's machine tool industry. *Research Policy*, *38*(3), 527–535. https://doi.org/10.1016/j.respol.2008.10.008

Chiaramonte, L., Dreassi, A., Piserà, S., & Khan, A. (2023). Mergers and acquisitions in the financial industry: A bibliometric review and future research directions. *Research in International Business and Finance*, *64*(December 2022), 0–3. https://doi.org/10.1016/j.ribaf.2022.101837

Cloodt, M., Hagedoorn, J., & Van Kranenburg, H. (2006). Mergers and acquisitions: Their effect on the innovative performance of companies in high-tech industries. *Research Policy*, *35*(5), 642–654. https://doi.org/10.1016/j.respol.2006.02.007

Cobo, M. J., Martínez, M. A., Gutiérrez-Salcedo, M., Fujita, H., & Herrera-Viedma, E. (2015). 25 years at Knowledge-Based Systems: A bibliometric analysis. *Knowledge-Based Systems*, *80*, 3–13. https://doi.org/10.1016/j.knosys.2014.12.035

Cumming, D., Jindal, V., Kumar, S., & Pandey, N. (2023). Mergers and acquisitions research in finance and accounting: Past, present, and future. *European Financial Management*, 1–41. https://doi.org/10.1111/eufm.12417

Cummins, J. D., & Xie, X. (2008). Mergers and acquisitions in the US property-liability insurance industry: Productivity and efficiency effects. *Journal of Banking and Finance*, *32*(1), 30–55. https://doi.org/10.1016/j.jbankfin.2007.09.003

De Beule, F., Elia, S., & Piscitello, L. (2014). Entry and access to competencies abroad: Emerging market firms versus advanced market firms. *Journal of International Management*, *20*(2), 137–152. https://doi.org/10.1016/j.intman.2013.05.002

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*(March), 285–296. https://doi.org/10.1016/j.jbusres.2021.04.070

Duchek, S. (2015). Enhancing absorptive capacity for innovation and change: The role of structural determinants. *Journal of Change Management*, *15*(2), 142–160. https://doi.org/10.1080/14697017.2014.988637

Duysters, G., & De Man, A. P. (2003). Transitory alliances: An instrument for surviving turbulent industries? *R and D Management*, *33*(1), 49–58. https://doi.org/10.1111/1467-9310.00281

Eulerich, M., Kopp, R., & Fligge, B. (2022). Mergers and acquisitions research — A bibliometric analysis. *European Management Journal*, *40*(6), 832–846. https://doi.org/10.1016/j.emj.2022.09.006

Ferreira, M. P., Santos, J. C., de Almeida, M. I. R., & Reis, N. R. (2014). Mergers & acquisitions research: A bibliometric study of top strategy and international business journals, 1980-2010. *Journal of Business Research*, *67*(12), 2550–2558. https://doi.org/10.1016/j.jbusres.2014.03.015

Fontana, R., & Nesta, L. (2009). Product innovation and survival in a high-tech industry. *Review of Industrial Organization*, *34*(4), 287–306. https://doi.org/10.1007/s11151-009-9210-7

Frankort, H. T. W. (2016). When does knowledge acquisition in R&D alliances increase new product development? the moderating roles of technological relatedness and product-market competition. *Research Policy*, *45*(1), 291–302. https://doi.org/10.1016/j.respol.2015.10.007

Gao, B. (2021). Exploration of talent mining based on machine learning and the influence of knowledge acquisition. *Knowledge Management Research and Practice*, 1–9. https://doi.org/10.1080/14778238.2021.1955631

Graebner, M. E. (2004). Momentum and serendipity: How acquired leaders create value in the integration of technology firms. *Strategic Management Journal*, *25*(8–9), 751–777. https://doi.org/10.1002/smj.419

Grigoriou, K., & Rothaermel, F. (2017). Organizing for knowledge generation: Internal knowledge networks and the contingent effect of external knowledge sourcing. *Strategic Management Journal*, *38*, 395–414. https://doi.org/10.1002/smj.2489

Guan, J. C., Mok, C. K., Yam, R. C. M., Chin, K. S., & Pun, K. F. (2006). Technology transfer and innovation performance: Evidence from Chinese firms. *Technological Forecasting and Social Change*, *73*(6), 666–678. https://doi.org/10.1016/j.techfore.2005.05.009

Haleblian, J., Devers, C. E., McNamara, G., Carpenter, M. A., & Davison, R. B. (2009). Taking stock of what we know about mergers and acquisitions: A review and research agenda. *Journal of Management*, *35*(3), 469–502. https://doi.org/10.1177/0149206308330554

Harzing, A.-W., & Alakangas, S. (2016). Google Scholar, Scopus and the Web of Science: A longitudinal and cross-disciplinary comparison. *Scientometrics*, *106*, 787–804. https://doi.org/10.1007/s11192-015-1798-9

Hemmert, M. (2004). The influence of institutional factors on the technology acquisition performance of high-tech firms: Survey results from Germany and Japan. *Research Policy*, *33*(6–7), 1019–1039. https://doi.org/10.1016/j.respol.2004.04.003

Huang, Z., Zhu, H. S., & Brass, D. J. (2017). Cross-border acquisitions and the asymmetric effect of power distance value difference on long-term post-acquisition performance. *Strategic Management Journal*, *38*(4), 972–991. https://doi.org/10.1002/smj.2530

Hughes, M., Hughes, P., & Morgan, R. E. (2007). Exploitative learning and entrepreneurial orientation alignment in emerging young firms: Implications for market and response performance. *British Journal of Management*, *18*(4), 359–375. https://doi.org/10.1111/j.1467-8551.2007.00519.x

Hull, C. E., & Covin, J. G. (2010). Learning capability, technological parity, and innovation mode use. *Journal of Product Innovation Management*, *27*(1), 97–114. https://doi.org/10.1111/j.1540-5885.2009.00702.x

Jin, J., & von Zedtwitz, M. (2008). Technological capability development in China's mobile phone industry. *Technovation*, *28*(6), 327–334. https://doi.org/10.1016/j.technovation.2007.06.003

Khan, A., Goodell, J. W., Hassan, M. K., & Paltrinieri, A. (2022). A bibliometric review of finance bibliometric papers. *Finance Research Letters*, *47*, 1–9. https://doi.org/10.1016/j.frl.2021.102520

Khan, A., Hassan, M. K., Paltrinieri, A., Dreassi, A., & Bahoo, S. (2020). A bibliometric review of takaful literature. *International Review of Economics and Finance*, *69*(June 2020), 389–405. https://doi.org/10.1016/j.iref.2020.05.013

Kim, J. D. (2022). Startup acquisitions, relocation, and employee entrepreneurship. *Strategic Management Journal*, *43*(11), 2189–2216. https://doi.org/10.1002/smj.3408

King, D. R., Slotegraaf, R. J., & Kesner, I. (2008). Performance implications of firm resource interactions in the acquisition of R&D-intensive firms. *Organization Science*, *19*(2), 327–340. https://doi.org/10.1287/orsc.1070.0313

Lee, J., & Lee, J. (2022). Enablers of postacquisition joint knowledge creation: evidence from joint patenting in high-tech mergers and acquisitions. *Journal of Knowledge Management*, *26*(3), 743–762. https://doi.org/10.1108/JKM-11-2020-0846

Leiponen, A. E. (2008). Competing through cooperation: The organization of standard setting in wireless telecommunications. *Management Science*, *54*(11), 1904–1919. https://doi.org/10.1287/mnsc.1080.0912

Li, J., & Hale, A. (2016). Output distributions and topic maps of safety related journals. *Safety Science*, *82*, 236–244. https://doi.org/10.1016/j.ssci.2015.09.004

Li, L., Liu, L., & Wu, H. (2022). Workforce education and corporate innovation. *Australian Journal of Management*, *47*(4), 599–629. https://doi.org/10.1177/03128962221077453

Lichtenthaler, U. (2008). Open innovation in practice: An analysis of strategic approaches to technology transactions. *IEEE Transactions on Engineering Management*, *55*(1), 148–157. https://doi.org/10.1109/TEM.2007.912932

Lin, B. W., Chen, C. J., & Wu, H. L. (2007). Predicting citations to biotechnology patents based on the information from the patent documents. *International Journal of Technology Management*, *40*(1–3), 87–100. https://doi.org/10.1504/ijtm.2007.013528

Lin, B. W., & Wu, C. H. (2010). How does knowledge depth moderate the performance of internal and external knowledge sourcing strategies? *Technovation*, *30*(11–12), 582–589. https://doi.org/10.1016/j.technovation.2010.07.001

Lin, L.-H., & Ho, Y.-L. (2021). Level and speed of acquisition integration and their effects on technological performance. *Journal of Strategy and Management*, *14*(4), 492–510. https://doi.org/10.1108/JSMA-03-2020-0051

Liu, X., & Zou, H. (2008). The impact of greenfield FDI and mergers and acquisitions on innovation in Chinese high-tech industries. *Journal of World Business*, *43*(3), 352–364. https://doi.org/10.1016/j.jwb.2007.11.004

Liu, Y., Zeng, Q., Li, B., Ma, L., & Ordieres-Meré, J. (2022). Anticipating financial distress of high-tech startups in the European Union: A machine learning approach for imbalanced samples. *Journal of Forecasting*, *41*(6), 1131–1155. https://doi.org/10.1002/for.2852

Makri, M., Hitt, M. A., & Lane, P. J. (2010). Complementary technologies, knowledge relatedness, and invention outcomes in high technology mergers and acquisitions. *Strategic Management Journal*, *31*(November 2009), 602–628. https://doi.org/10.1002/smj.829

Martens, M. L., Jennings, J. E., & Jennings, P. D. (2007). Do the stories they tell get them the money they need? The role of entrepreneurial narratives in resource acquisition. *Academy of Management Journal*, *50*(5), 1107–1132. https://doi.org/10.5465/AMJ.2007.27169488

Meglio, O. (2009). Measuring performance in technology-driven M&AS: Insights from a literature review. *Advances in Mergers and Acquisitions*, *8*, 103–118. https://doi.org/10.1108/S1479-361X(2009)0000008008

Miyazaki, H. (2009). An analysis of the relation between R&D and M&A in high-tech industries. *Applied Economics Letters*, *16*(2), 199–201. https://doi.org/10.1080/13504850601018163

Nguyen, B., Yu, X., Melewar, T. C., & Chen, J. (2015). Brand innovation and social media: Knowledge acquisition from social media, market orientation, and the moderating role of social media strategic capability. *Industrial Marketing Management*, *51*, 11–25. https://doi.org/10.1016/j.indmarman.2015.04.017

Paltrinieri, A., Hassan, M. K., Bahoo, S., & Khan, A. (2019). A bibliometric review of sukuk literature. *International Review of Economics and Finance*, *86*, 897–918. https://doi.org/10.1016/j.iref.2019.04.004

Pan, X., Song, M. L., Zhang, J., & Zhou, G. (2019). Innovation network, technological learning and innovation performance of high-tech cluster enterprises. *Journal of Knowledge Management*, *23*(9), 1729–1746. https://doi.org/10.1108/JKM-06-2018-0371

Ramadan, B. M., Dahiyat, S. E., Bontis, N., & Al-dalahmeh, M. A. (2017). Intellectual capital, knowledge management and social capital within the ICT sector in Jordan. *Journal of Intellectual Capital*, *18*(2), 437–462. https://doi.org/10.1108/JIC-06-2016-0067

Roberts, E. B., & Liu, W. (2001). Ally or acquire? How technology leaders decide. *MIT Sloan Management Review*, *Fall*, 26–34.

Rossi, M., Tarba, S. Y., & Raviv, A. (2013). Mergers and acquisitions in the hightech industry: A literature review. *International Journal of Organizational Analysis*, *21*(1), 66–82. https://doi.org/10.1108/19348831311322542

Schildt, H. A., Maula, M. V. J., & Keil, T. (2005). Explorative and exploitative learning from external corporate ventures. *Entrepreneurship: Theory and Practice*, *29*(4), 493–515. https://doi.org/10.1111/j.1540-6520.2005.00095.x

Shi, Z., Lee, G. M., & Whinston, A. (2016). Toward a better measure of business proximity: Topic modeling for industry intelligence. *MIS Quarterly*, *40*(4), 1035–1056. https://doi.org/10.25300/MISQ/2016/40.4.11

Shimizu, K., Hitt, M. A., Vaidyanath, D., & Pisano, V. (2004). Theoretical foundations of cross-border mergers and acquisitions: A review of current research and recommendations for the future. *Journal of International Management*, *10*, 307–353. https://doi.org/10.1016/j.intman.2004.05.005

Tarba, S. Y., Ahammad, M. F., Junni, P., Stokes, P., & Morag, O. (2019). The impact of organizational culture differences, synergy potential, and autonomy granted to the acquired high-tech firms on the M&A performance. *Group and Organization Management*, *44*(3), 1–38. https://doi.org/10.1177/1059601117703267

Thneibat, M. M., Obeidat, A. M., Obeidat, Z. M., Al-Dweeri, R., & Thneibat, M. (2022). Promoting radical innovation through performance-based rewards: The mediating role of knowledge acquisition and innovative work behavior. *International Journal of Innovation and Technology Management*, *19*(2), 1–22. https://doi.org/10.1142/S0219877022500055

Tsai, K. H., Hsieh, M. H., & Hultink, E. J. (2011). External technology acquisition and product innovativeness: The moderating roles of R&D investment and configurational context. *Journal of Engineering and Technology Management*, *28*(3), 184–200. https://doi.org/10.1016/j.jengtecman.2011.03.005

Uhlenbruck, K., Hitt, M. A., & Semadeni, M. (2006). Market value effects of acquisitions involving internet firms; A resource-based analysis. *Strategic Management Journal*, *27*, 899–913. https://doi.org/10.1002/smj.546

Van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3

Vasudeva, G., Spencer, J. W., & Teegen, H. J. (2013). Bringing the institutional context back in: A cross-national comparison of alliance partner selection and knowledge acquisition. *Organization Science*, *24*(2), 319–338. https://doi.org/10.1287/orsc.1120.0743

Wagner, M. (2010). Acquisitions as a means of innovation sourcing by incumbents and growth of technology-oriented ventures. *International Journal of Technology Management*, *52*(1/2), 118–134. https://doi.org/10.1504/IJTM.2010.035858

Walsh, S. T., & Linton, J. D. (2011). The strategy-technology firm fit audit: A guide to opportunity assessment and selection. *Technological Forecasting and Social Change*, *78*(2), 199–216. https://doi.org/10.1016/j.techfore.2010.06.023

Waltman, L. (2016). A review of the literature on citation impact indicators. *Journal of Informetrics*, *10*(2), 365–391. https://doi.org/10.1016/j.joi.2016.02.007

Wang, C., Chin, T., & Lin, J. H. (2020). Openness and firm innovation performance: the moderating effect of ambidextrous knowledge search strategy. *Journal of Knowledge Management*, *24*(2), 301–323. https://doi.org/10.1108/JKM-04-2019-0198

Wang, C. H., Chang, C. H., & Shen, G. C. (2015). The effect of inbound open innovation on firm performance: Evidence from high-tech industry. *Technological Forecasting and Social Change*, *99*, 222–230. https://doi.org/10.1016/j.techfore.2015.07.006

Weber, Y., & Tarba, S. (2011). Exploring integration approach in related mergers: Post-merger integration in the high-tech industry. *International Journal of Organizational Analysis*, *19*(3), 202–221. https://doi.org/10.1108/19348831111149178

Wei, T., & Clegg, J. (2020). Untangling the integration–performance link: Levels of integration and functional integration strategies in post-acquisition integration. *Journal of Management Studies*. https://doi.org/10.1111/joms.12571

Xie, X., Zou, H., & Qi, G. (2018). Knowledge absorptive capacity and innovation performance in high-tech companies: A multi-mediating analysis. *Journal of Business Research*, *88*(June 2017), 289–297. https://doi.org/10.1016/j.jbusres.2018.01.019

Xue, Y. (2007). Make or buy new technology: The role of CEO compensation contract in a firm's route to innovation. *Review of Accounting Studies*, *12*(4), 659–690. https://doi.org/10.1007/s11142-007-9039-y

Yang, M., & Ai, Q. (2021). The post-acquisition performance of cross-border mergers and acquisitions conducted by Chinese firms in the high-tech industries: Profitable or innovative? *Thunderbird International Business Review*, *63*(3), 355–367. https://doi.org/10.1002/tie.22192

Zhou, K. Z., & Li, C. B. (2012). How knowledge affects radical innovation: Knowledge base, market knowledge acquisition, and internal knowledge sharing. *Strategic Management Journal*, *33*, 1090–1102. https://doi.org/10.1002/smj.1959

Zhou, X., Mitkova, L., Zhang, Y., Huang, L., Cunningham, S., Shang, L., Huizhu, Y., & Wang, K. (2018). Technology-driven mergers and acquisitions of Chinese acquirers: development of a multi-dimensional framework for post-innovation performance. *International Journal of Technology Management*, *78*(4), 280–309. https://doi.org/10.1504/IJTM.2018.095759

Zhu, H., & Qian, G. M. (2015). High-tech firms' international acquisition performance: The influence of host country property rights protection. *International Business Review*, *24*(4), 556–566. https://doi.org/10.1016/j.ibusrev.2014.10.013

Zhu, H., Xia, J., & Makino, S. (2015). How do high-technology firms create value in international M&A? Integration, autonomy and cross-border contingencies. *Journal of World Business*, *50*(4), 718–728. https://doi.org/10.1016/j.jwb.2015.01.001