European Management Journal 40 (2022) 572–589

Contents lists available at ScienceDirect

European Management Journal

journal homepage: www.elsevier.com/locate/emj

Evolution of industry 4.0 and international business: A systematic literature review and a research agenda

Rebecca Castagnoli [a,*], Giacomo Büchi [a], Régis Coeurderoy [b], Monica Cugno [a]

[a] Università Degli Studi di Torino, Corso Unione Sovietica, 218 Bis, 10134, Turin, Italy
[b] ESCP Europe, Paris Campus, 79, Avenue de La République, 75543, Paris Cedex 1, France

ARTICLE INFO

Keywords:
Industry 4.0
International business
Theory
Context
Characteristics
Method (TCCM) framework
Fourth industrial revolution
Global value chains

ABSTRACT

Industry 4.0 has attracted significant attention from researchers in the international business field for a decade. This paper critically analyzes the literature on the relationships between Industry 4.0 and international business. A systematic literature review of 59 studies published between 2011 and December 2020 is conducted. Using the Theory, Context, Characteristics, and Method (TCCM) framework, the review identifies various gaps in research and proposes future research agenda. The results show that (1) Industry 4.0 modifies specific domains in the field of international competitiveness and organization and (2) international business affects the choices and opportunities of adopting Industry 4.0. The need for further theoretical development in the relationships between international business and Industry 4.0 is observed especially in terms of location choices, global value chains, international organizations and international trade. The results contribute to the relevant research field and provide substantial managerial implications.

1. Introduction

For a decade, the rise of the Fourth industrial revolution or Industry 4.0 has been claimed as a powerful driver of business transformation in managerial and economic literature (Brynjolfsson & McAfee, 2014; Ghauri, Strange, & Cooke, 2021; Popkova et al., 2019; Schwab, 2017; Ustundag & Cevikcan, 2017). This is particularly true in strategy and analysis (Chiarini, Belvedere, & Grando, 2020), planning and implementation (Bueno, Godinho Filho, & Frank, 2020), cooperation and networks (Jiang, Sun, Xu, Zhao, & Chen, 2020), business model (Müller, Buliga, & Voigt, 2020), human resources (Flores, Xu, & Lu, 2020), change and leadership (Fatorachian & Kazemi, 2021), information systems (Hernes et al., 2020), international business (Hannibal, 2020), and international marketing (Samiee, 2020).

The term Fourth industrial revolution was coined in 1988 to identify those processes that turn invention into innovation, owing to scientists being included in production teams (Rostow, 1988). However, the meaning was modified more recently to include the technological axis based on communication, intermediation, and relationship environment 4.0 (Schwab, 2016). The term "Industry 4.0" was used with this meaning for the first time at the Hannover Fair, to improve German firms' competitiveness (Kagermann, Lukas, & Wahlster, 2011).

Environment 4.0 is achieved by equipping companies with Cyber-Physical Systems (CPS) and/or Cyber-Physical-Production Systems (CPPS) and the 4.0 technologies (Lu, 2017), such as advanced manufacturing, augmented reality, Internet of things, big data, cloud computing, cyber-security, additive manufacturing, simulation, and horizontal and vertical integration (Rüßmann et al., 2015). Industry 4.0 allows a flexible environment (Hughes, Dwivedi, Rana, Williams, & Raghaven, 2020) based on two disruptive key factors: integration along the value chain (Liao, Deschamps, Loures, & Ramos, 2017; Reischauer, 2018) and interoperability of production (Lasi, Fettke, Kemper, Feld, & Hoffmann, 2014; Lu, 2017). In addition, the proposed set of information technologies facilitates the acquisition, storage, processing, and delivery of information (Rose, 2015, pp. 1–2).

Therefore, the Industry 4.0 environment allows significant changes in business management (Schneider, 2018), and firms' international activities are not exempt from this transformation.

The technological challenge of the Fourth Industrial Revolution, in fact, introduces opportunities for the development of new strategies, markets, and industries. These changes also led to the emergence of born-digital firms that open several possibilities in the processes and

* Corresponding author.
E-mail addresses: rebecca.castagnoli@unito.it (R. Castagnoli), giacomo.buchi@unito.it (G. Büchi), rcoeurderoy@escp.eu (R. Coeurderoy), monica.cugno@unito.it (M. Cugno).

https://doi.org/10.1016/j.emj.2021.09.002
Received 14 December 2020; Received in revised form 23 June 2021; Accepted 2 September 2021
Available online 4 September 2021

pace of internationalization (Monaghan, Tippmann, & Coviello, 2020). Over the past decade, scholars have increasingly paid attention to these changes. As the field is emerging, the literature is still fragmented and non-exhaustive, sometimes contrasting, or describing changes in particular kinds of firms in specific markets across borders and analyzing individual 4.0 technologies.

Ten years after the birth of the Industry 4.0 phenomenon, it is useful and imperative to reconstruct a complete and systematic framework synthesizing the fragmented research on the deep mutual transformations existing between Industry 4.0 and international business. On the one hand, Industry 4.0 changes internationalization strategies transforming, for example, the structure of global value and supply chains (Dzwigol, Dzwigol-Barosz, & Kwilinski, 2020; Kano, Tsang, & Yeung, 2020) or the dynamics of competition (Porter & Heppelmann, 2014). On the other hand, the international configuration of firms (Matias & Hernandez, 2019) and countries' characteristics (Raj, Dwivedi, Sharma, de Sousa Jabbour, & Rajak, 2020), influences the choices in Industry 4.0, such as technological adoption and consequent performances. Moreover, several mutual impacts exist between these two research fields (Götz, 2020a). Therefore, it appears relevant to make an overall assessment of this dispersed literature and pave the way for future research on innovation in international business.

To achieve this objective, the study carries out a systematic review on the interplay between Industry 4.0 and international business. The state of the art is presented in a systematic, transparent, rigorous, and reproducible way following a framework-based review (Paul & Criado, 2020; Snyder, 2019; Vrontis & Christofi, 2019). The analysis period covers between 2011 and December 2020. The proposed research agenda is based on the Theory, Context, Characteristics, and Methodology (TCCM) framework (Paul & Rosado-Serrano, 2019), which allows the development of theoretical highlights in a clear, incisive, and comprehensive way.

The study aims to answer three challenging research questions: (RQ1) What are the salient characteristics of the articles contributing to the development of the topic? (RQ2) What are the new research streams addressed on the topic? and (RQ3) What are the uncovered gaps for future research? Basically, our main objective is to assess whether industry 4.0 is an innovation that can change the rules of international business, particularly in terms of distance and location choice, organization and governance, and international exchanges.

We bring two main theoretical contributions. First, the analysis goes beyond existing literature reviews on the topic and provides the first systematic and comprehensive framework exploring how the rise of 4.0 technologies may impact the evolution of international business. Second, the research paves the way for future research through six research directions at the intersection of the two fields.

2. Methods

The study carries out a systematic qualitative review based on the scientific databases Web of Science (WoS), EBSCO, and Scopus. We use a strict systematic review process to collect relevant articles and employ a qualitative approach to assess their contributions (Grant & Booth, 2009). The period on analysis ranges between 2011 and December 2020.

The choice to use WoS depends on the predominance of high-quality, peer-reviewed journals dealing with internationalization-related themes, ensuring both the academic standards and quality of the papers published and included within this sample (Jones, Coviello, & Tang, 2011). Furthermore, Scopus and WoS are among the most authoritative international sources of academic work in social sciences (Vieira & Gomes, 2009). They guarantee an optimal balance between (i) good coverage of existing works; (ii) convenience in retrieving papers; and (iii) homogeneity of information in the database. We used the EBSCO information service, the leading provider of research databases, to integrate the results.

The systematic literature review is assumed to be the best approach to synthesize and compare evidence from various sources (Williams, Clark, Clark, & Raffo, 2020). The article addresses the proposed research questions by analyzing studies that investigate various aspects of the relationships of interest. The study's results are of particular interest to academics, policymakers, and practitioners (Frank & Hatak, 2014, pp. 94–117; Snyder, 2019). In particular, the research conducts a domain-based literature review (Palmatier, Houston, & Hulland, 2018) in three phases: 1. Planning the review, 2. Conducting the review, 3. Analysis and reporting. Each phase is structured in successive steps (Denyer & Tranfield, 2009; Tranfield, Denyer, & Smart, 2003; Williams et al., 2020) and is reported in the following subsections. Phase 1 – planning the review, is divided into four steps: (i) aim identification; (ii) keywords recognition; (iii) pointing out of five search criteria; (iv) development of inclusion/exclusion criteria. Phase 2 – conducting the review, is divided into three steps: (i) application of search strings and search criteria to three scientific databases; (ii) removal of duplicates; (iii) abstract reading and inclusion/exclusion criteria application. Phase 3 – analysis and reporting are divided into three steps: (i) realization of the two analysis grids; (ii) creation of the database and collection of information; (iii) analysis of the database.

2.1. Phase 1 – planning the review

The first phase – planning the review – is divided into four steps (Fig. 1).

Step 1 - aim identification.

The first step identifies the aim of the study. As mentioned before, the study builds a critical understanding of the interplay between Industry 4.0 and international business. In addition, it provides a reinterpretation of international business theories in the new scenario introduced by Industry 4.0. Three research questions (RQs) are proposed (Williams et al., 2020): (RQ1) What are the salient characteristics of the articles contributing to the development of the topic? (RQ2) What are the new research streams addressed on the topic? (RQ3) What are the uncovered gaps for future research?

Step 2 – keywords recognition.

The second step recognizes various keywords based on the background analysis of the existing literature and the authors' experience. The resulting keywords are divided into three categories: Industry 4.0 (17 keywords); 4.0 technologies (9 keywords); and internationalization (37 keywords). Truncation was used in the search terms to find all relevant studies that have variants of the keywords. Moreover, the keywords in each category are associated with the Boolean OR operator to create a search string for the respective categories. Different categories of keywords are associated with the Boolean AND operator to develop combined search strings. Therefore, the search string used is as reported in Fig. 1. Their combination represents the research string applied to title abstract keywords to select the relevant articles.

Step 3 – pointing out of five search criteria.

The third step identifies the sampled studies according to the five search criteria most adopted by the literature to identify papers in the systematic literature reviews: cover period, language, type of document, research area, and categories. The starting year is marked by the first time in which the Industry 4.0 terms were introduced at the Hannover Fair in 2011 (Kagermann, Helbig, Hellinger, & Wahlster, 2013). The choice to include only English language papers is because English is the language internationally used for research.

The analyzed research areas are business economics, and the selected categories are business, management, and economics to better identify the organizational and managerial changes at the firm level.

The systematic literature review is based on a solid base of high-quality papers published in journals included in the ABS list: 13 papers are marked in the ABS list with 3, 4, or 4* (Journal of International Business Studies, Journal of Management Studies, Journal of World Business, Journal of Information Technology, International Business Review, Computers in Industry, Technological Forecasting and Social

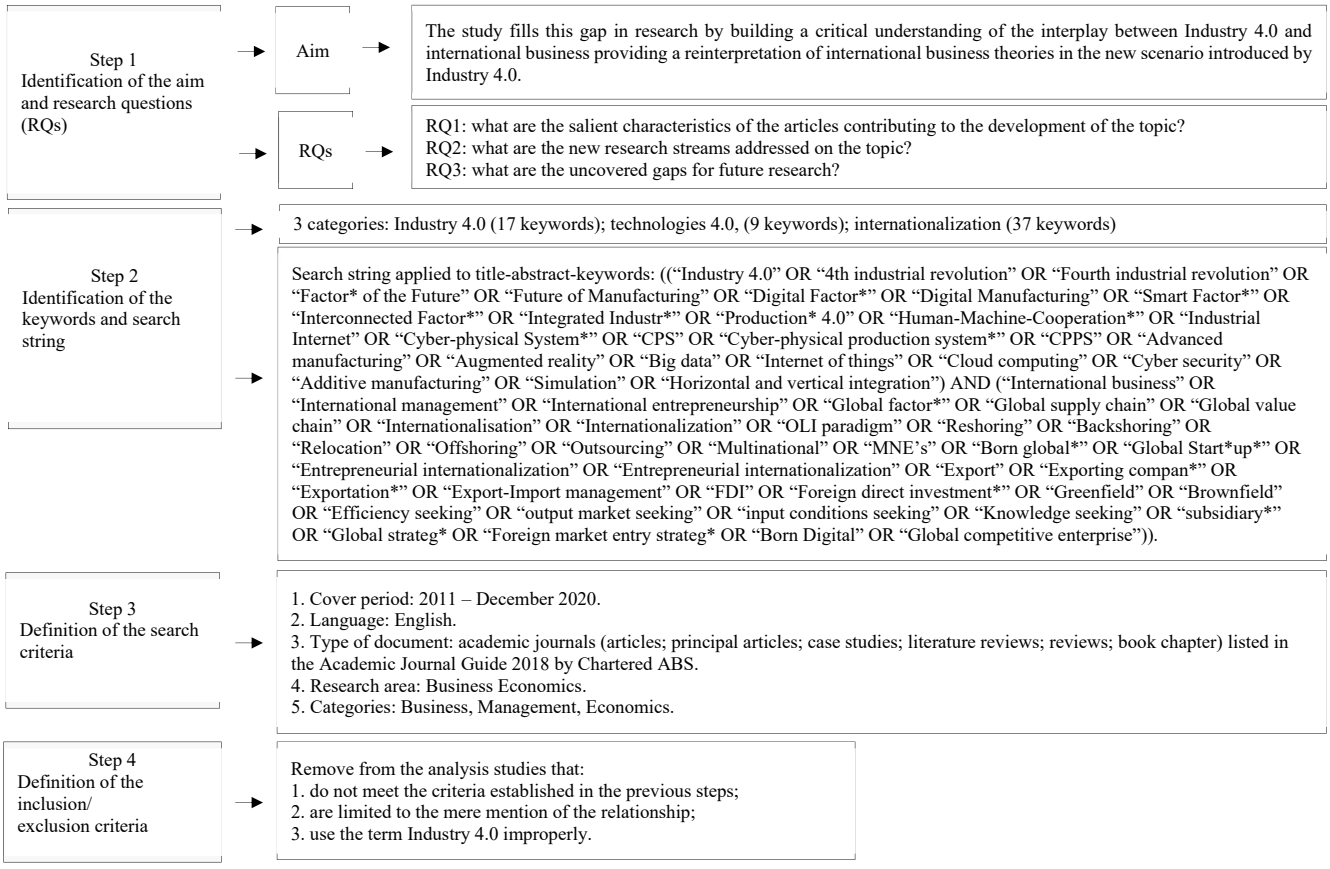

Fig. 1. Planning the review.

Change; International Marketing Review; Journal of Business Research); 19 are marked 1 and 2 in the ABS list. The topic Industry 4.0 and international business is still emerging, yet it introduces epochal changes to be explored under multiple viewpoints. The sample is expanded by including 27 articles that were published in eminent journals of quality, rigor, and scientific interest and two peer-reviewed book chapters. Quality, rigor, and scientific interest of these articles are measured following the Hirsch index (H Index), SCImago Journal Rank, and Impact Factor. The sample of papers thus composed allows us to map completely, the transformations in Industry 4.0 and international business allowing more prestigious publications on the topic.

Step 4 – development of inclusion/exclusion criteria.

The fourth step identifies inclusion/exclusion criteria. Papers that did not fulfill the following criteria were excluded from the analysis:

i) do not meet the criteria set out in the previous phases;
ii) only mention the relationship;
iii) make improper use of the term Industry 4.0.

Industry 4.0 is often wrongly associated with the following terms:

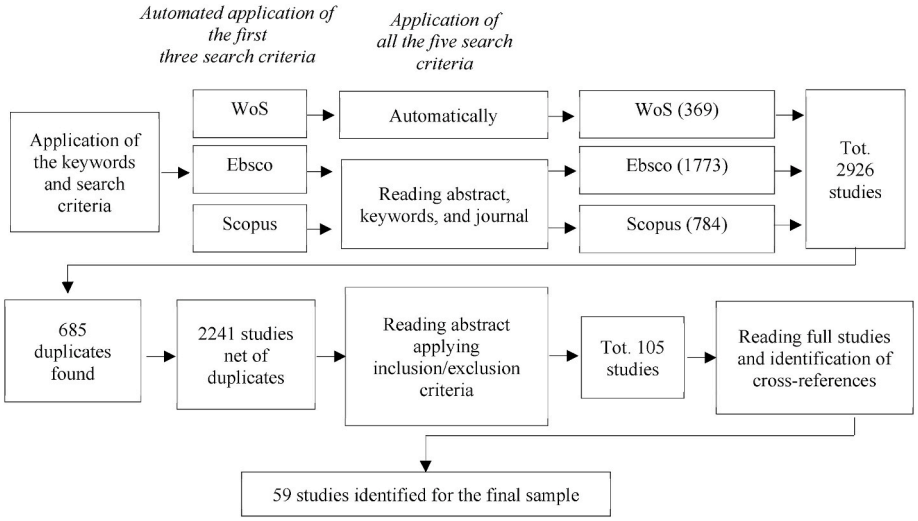

Fig. 2. Conducting the review.

digitalization (the increase in the use of information technology by an organization or a country) and digitization (the conversion of analog data such as images, videos, and text into digital form) (Schneider, 2018).

2.2. Phase 2 – conducting the review

The second phase – conducting the review – is divided into four steps (Fig. 2).

Step 1 – application of search strings and search criteria to three scientific databases.

The first step begins with the application of search strings and search criteria to the three scientific databases: WoS, EBSCO, and Scopus. The selected databases help identify management studies conducted by leading international universities. The application of the search criteria depends on the database used. With WoS, all five criteria can be applied automatically. EBSCO allows the automatic application of the first four criteria. Scopus only allows the automatic application of the first three criteria. For the selection criteria not covered in EBSCO and Scopus, the field is narrowed by reading the journal name, and the title, and the keywords of the studies. At the end of this phase, 2926 studies were identified.

Step 2 – removal of duplicates.

In the second step, duplicates were eliminated (685), resulting in 2241 articles.

Step 3 – abstract reading and inclusion/exclusion criteria application.

In the third step, a careful reading of all the abstracts, applying the inclusion/exclusion criteria to all three databases, allowed us to identify 105 relevant papers. This step allows to single out the multiple meanings of some keywords – such as the 4.0 technologies of simulation and horizontal and vertical integration. Since these keywords often identify articles not directly related to industry 4.0, the related papers are eliminated. Although few keywords have multiple meanings, the use of these keywords in research cannot be avoided because the technologies they represent are as essential as the other 4.0 technologies. In the fourth step, 105 articles identified in the previous phase are read and after applying the inclusion/exclusion criteria, finally, 59 studies fully meet the proposed aim are selected.

To limit the degree of subjectivity in applying the inclusion and exclusion criteria and, consequently, increase the reliability of the results, the analysis of the abstracts, full papers, and cross-references are conducted separately by each author. The results are discussed to reach a consensus.

2.3. Phase 3 – analysis and reporting

The third phase – analysis and reporting – is divided into three steps (Fig. 3).

Step 1 – realization of the two analysis grid.

In the first step, two analysis grids are constructed: a general grid, containing information on the characteristics of the sample, and a thematic grid, identifying information on the central issues of the topic. The general grid is set up with a units-variables matrix, where the units are the individual papers of the sample indicated by the authors' names, and the reported variables are given in Fig. 3, step 1a (year of publication, name of the journal, etc.).

The thematic grid is also set up with a units-variables matrix, where the units are the individual papers in the sample indicated by the authors' names and the variables are: research questions/hypotheses explored, main gaps addressed, and the main results identified (Fig. 3, step 1b).

Step 2 – creation of the database and collection of information.

In the second step, data from the two analysis grids are collected and the two grids are integrated into a database in SPSS for the analysis of the main variables.

Step 3 – analysis of the database.

In the third step, the information from this database is processed to answer RQ1 (see § 3.1), RQ2 (see § 3.2). Based on the responses to RQ1 and RQ2 and using the TCCM framework (see § 3.3) research gaps are identified answering RQ3. A future research agenda is created through the propositions (see § 4).

3. Findings

The results obtained from the 59 sampled studies allow a suitable answering of the research questions 1 (§ 3.1), 2 (§ 3.2), and 3 (§ 3.3). As mentioned already, the research questions are: RQ1 what are the salient characteristics of the articles contributing to the development of the topic? RQ2 what are the new research streams addressed on the topic? RQ3 what are the uncovered gaps for future research?

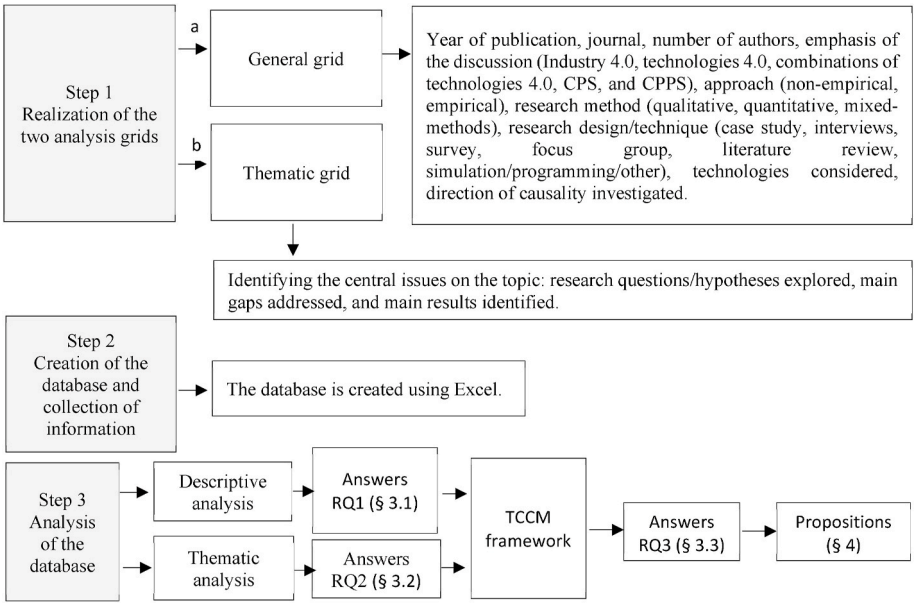

Fig. 3. Analysis and reporting.

3.1. Salient characteristics of the literature on the topic

The descriptive analysis examines the information collected through the general grid. The number of relevant studies increased drastically from 2016, nearly doubling each year compared to the previous year (Fig. 4). This phenomenon may be due to the several industrial plans adopted by governments worldwide. The first government to launch an Industry 4.0 plan was the German government (Kagermann et al., 2013). Other countries such as France (Conseil National de l'Industrie, 2013), the United Kingdom (Foresight, 2013), and the United States (Rafael, Shirley, & Liveris, 2014) followed the German example. The same path was taken by China (Wübbeke, Meissner, Zenglein, Ives, & Conrad, 2016) and South Korea (Kang et al., 2016) followed by Brazil (Agência Brasileira de Desenvolvimento Industrial (ABDI), 2017) and Italy (Ministero dello Sviluppo Economico (MISE), 2018).

Significant differences exist among different journals (e.g., Journal of World Business, Business Horizons, Technological Forecasting and Social Change, International Business Review, and Journal of Management Studies, etc.), which primarily relate to international business (Table 1). In particular, 53 studies between journals and books are addressed, but only Technological Forecasting and Social Change feature three studies published on the topic, while the Journal of World Business, Technology Innovation Management Review, and IEEE Engineering Management Review have each published two articles on the subject, and the other journals have published only one relevant study. Most of the journals develop topics related to innovation and technologies (i.e., Computers in Industry, Technological Forecasting and Social Change, Technology Innovation Management Review, IEEE Engineering Management Review, Journal of Information Technology, and Science Technology and Society, among the others). Hence, this study considers not only the journals specialized in the field of international business but also innovation management. This choice signals the increasingly important role of technologies in business management within and beyond the geographical borders of the country of origin.

Table 2 shows that most sampled articles use an empirical (40 studies) rather than a non-empirical approach (19 studies). Few studies using a non-empirical approach address the impact of various Industry 4.0 technologies on international business through literature reviews or document analysis. In our sample, only two systematic literature reviews are identified, which focus on specific issues. The first one analyzes 57 articles on the effects of industry 4.0 on manufacturing reshoring (Barbieri, Ciabuschi, Fratocchi, & Vignoli, 2018). The second one is a concept-centric literature review of 73 papers on the effects of big data on internationalization (Dam, Le Dinh, & Menvielle, 2019). The sample of this review is bigger than ours since different research areas are selected. Dam et al. (2019) analyze papers within marketing and information systems, while the current study selects papers within economics, business, and management research areas. The remaining review papers can be classified into two broad groups. The first group is about specific international business domains, such as the impact of industry 4.0 on Foreign Direct Investment (FDI), analyzed through a narrative literature review by Götz (2020b), or international marketing, analyzed through a reflexive literature review combined with content analysis on 126 papers by Sinkovics and Sinkovics (2020). The second group is about specific technologies such as the internet of things, big data, advanced manufacturing, and additive manufacturing (Strange & Zucchella, 2017). The objective of this study is to present a global overview of the reciprocal transformations between industry 4.0 and international business. Therefore, all the referenced review articles differ from this paper. The methods used for empirical analysis are both qualitative (16) and quantitative (17), with a limited presence of mixed methods (7). From a qualitative point of view, 11 case studies and five interviews are used in the subsample of 16 qualitative papers. However, case studies are limited by the small number of occurrences and are often analyzed as a single case (7) or two cases (4). From a quantitative perspective, the prevalence of surveys on primary data (12 surveys in the subsample of 17 quantitative studies) is observed in the sampled studies against secondary data (4) and industrial experiments (1).

Regarding the mixed methods, there is a prevalence of papers jointly adopting case studies and interviews (4) against interviews and surveys (3).

Overall, information on the topic remains fragmented. Most of the studies are based on a limited sample or individual case studies addressing specific industries. In addition, most case studies investigate information technology producers such as Microsoft (Abed & Chavan, 2019) and Ericson (Khanagha, Ramezan Zadeh, Mihalache, & Volberda, 2018). Limited sample or individual case studies do not enable a global, unambiguous, and generalizable understanding of the phenomenon. Several studies address a large sample of companies, and others are emerging as working papers (Bettiol, Capestro, De Marchi, & Di Maria, 2020). However, most studies focus on specific perspectives in international business, such as the back shoring phenomenon (Dachs, Kinkel, & Jäger, 2019), the international growth of SMEs (Del Giudice, Scuotto, Garcia-Perez, & Petruzzelli, 2019), or specific technologies such as cloud computing (Hosseini, Fallon, Weerakkody, & Sivarajah, 2019).

The emphasis is generally laid on one, or a maximum of four technologies (Table 3), or Industry 4.0 as a whole (25 studies). Other industry 4.0 technologies are analyzed separately or in restricted combinations. In studies addressing one or more 4.0 technologies, cloud computing is the most analyzed aspect (addressed individually in nine studies and in combination with other technologies in six studies), followed by big data (analyzed in isolation by four studies and in

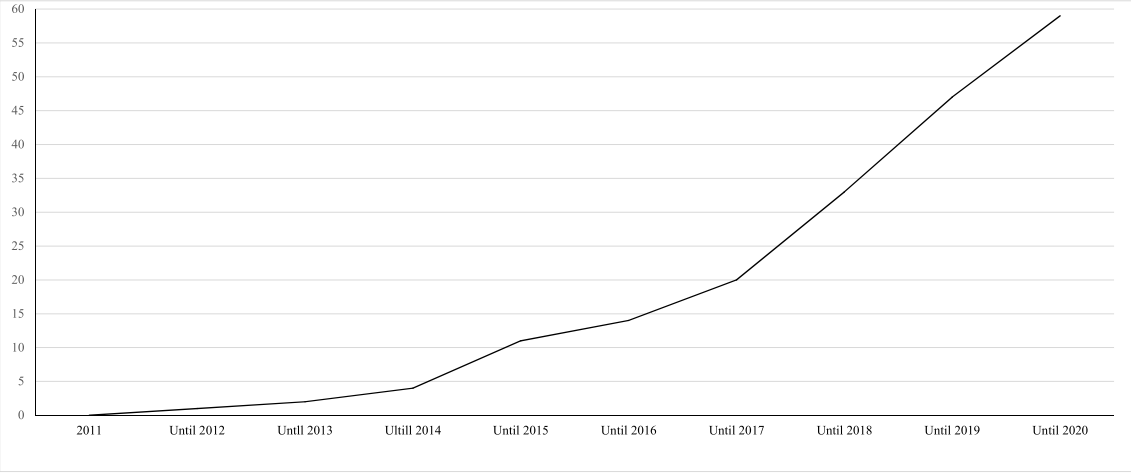

Fig. 4. Year of publication of the referenced articles.

Table 1
Bibliographic sources on Industry 4.0 and international business.

Journal	Authors name, year	Ranking	N. of articles referenced
Agrekon	Cameron et al. (2017).	1, ABS list	1
Asian Journal of Innovation & Policy	Kim, Abe, and Valente (2019).	Several scientific rankings	1
Asia-Pacific Social Science Review	Kim, Torneo, and Yang (2019).	Several scientific rankings	1
Business Horizons	Attaran (2017).	2, ABS list	1
Business Management and Education	Kaivo-Oja et al. (2018).	Several scientific rankings	1
Competitiveness Review	Gö;tz (2020a).	1, ABS list	1
Computers in Industry	Q. Li, Luo, et al., 2015.	3, ABS list	1
Economic and Political Weekly	Banga (2019).	Several scientific rankings	1
E15Initiative, International Centre for Trade and Sustainable Development and World Economic Forum	Eden (2020).	Several scientific rankings	1
Enterprise Information Systems	Q. Li, Wang, et al., 2015.	2, ABS list	1
Book "Focused Issue on Building New Competences in Dynamic Environments"	Ahokangas et al. (2014).	Peer-reviewed book	1
Foresight and Science, Technology, and Innovation (STI) Governance	Götz (2019).	H index 13	1
Global Business Review	Matias and Hernandez (2019).	1, ABS list	1
IEEE Engineering Management Review	Ancarani & Di Mauro, 2018; Choi, 2018.	Several scientific rankings	2
Industrial Management and Data Systems	Lv and Lin (2017).	2, ABS list	1
International Business in the Information and Digital Age (Progress in International Business Research) Emerald Publishing Limited.	Eden, 2020.	Several scientific rankings	1
International Business Management	Manap and Rouhani (2014).	H index 17	1
International Business Review	Hannibal and Knight (2018).	3, ABS list	1
International Journal of Entrepreneurship	Dzwigol et al., 2020.	Several scientific rankings	1
International Journal of Information Management	Hosseini et al. (2019).	2, ABS list	1
International Journal of Logistics Management	Schmidt et al. (2020).	1, ABS list	1
International Journal of Product Development	Chang and Yeh (2018).	Several scientific rankings	1
International Journal of Supply Chain Management	Majeed and Rupasinghe (2017).	Several scientific rankings	1
International marketing review	Sinkovics and Sinkovics (2020).	3, ABS list	1
Journal of Asian Finance, Economics and Business	Kim and Seo (2018).	Several scientific rankings	1
Journal of business research	Cheng et al. (2020).	3, ABS list	1
	He and Wang (2015).	2, ABS list	1
Journal of Global Information Management	Barbieri et al. (2018).	Several scientific rankings	1
Journal of Global Operations and Strategic Sourcing	Götz, 2020b.	1, ABS list	1
Journal of East-West business	Özemre and Kabadurmus (2020).	2, ABS list	1
Journal of Enterprise Information Management	Kenney et al. (2015).	2, ABS list	1
Journal of Industry, Competition and Trade	Luftman et al. (2015).	3, ABS list	1
Journal of Information Technology	Calof and Viviers (2020).	Several scientific rankings	1
Journal of Intelligence Studies in Business	Laplume et al. (2016).	4*, ABS list	1
Journal of International Business Studies	Hannibal (2020).	1, ABS list	1
Journal of International Entrepreneurship	Khanagha et al. (2018).	4, ABS list	1
Journal of Management Studies	Stentoft et al. (2020). Szász et al. (2020).	1, ABS list	2
Journal of Manufacturing Technology Management	Dam et al. (2019).	H Index 8	1
Journal of Marketing Analytics	Raymond et al. (2015).	3, ABS list	1
Journal of Small Business Management	Ancarani et al., 2019; Dachs et al. (2019).	4, ABS list	2
Journal of World Business	Strange and Zucchella (2017).	2, ABS list	1
Multinational Business Review	Naglič et al. (2020).	Several scientific rankings	1
Organizacija	Szalavetz (2019b).	1, ABS list	1
Post-Communist Economies	Hmood and Ai-Madi (2013).	Several scientific ranking	1
Research Journal of Business Management	Abed and Chavan (2019).	2, ABS list	1
Science Technology and Society	Jovanović and Đoković (2016).	Several scientific rankings	1
Serbian Project Management Journal	GruŽAuskas, JegelaviČIŪTĖ, & Navickas, 2017.	Several scientific rankings	1
Social & Economic Revue	Kostin (2018).	Several scientific rankings	1
Strategic Management	Makris et al. (2019).	1, ABS list	1
Supply Chain Forum	Del Giudice et al., 2019; Horváth & Szabó, 2019; Szalavetz, 2019a.	3, ABS list	3
Technological Forecasting and Social Change	Mohr & Khan, 2015; Neubert, 2018.	Several scientific rankings	2
Technology Innovation Management Review	Sousa (2018).	1, ABS list	1
Transnational Corporations Review	Mangal and Karmarkar (2012).	Peer-reviewed book	1
Project "Ucla Anderson Business and Information Technologies"			
Total			59

Table 2
Widely used approaches, methods, and design/techniques in the research on Industry 4.0 and international business.

Approach	Method	Design or technique	Authors name, year
Non-empirical (19)		Conceptual (13)	Dzwigol et al., 2020; Eden, 2016; Eden, 2018; Attaran, 2017; Choi, 2018; Hannibal & Knight, 2018; Gružauskas, Jegelavičiūtė, & Navickas, 2017; Hmood & Ai-Madi, 2013; Kim, Abe, & Valente, 2019; Jovanović & Đoković, 2016; Kenney et al., 2015; Laplume et al., 2016; Mohr & Khan, 2015.
		Review (3)	Gö; tz, 2020b; Sinkovics & Sinkovics, 2020; Strange & Zucchella, 2017.
		Systematic literature review (2)	Barbieri et al., 2018; Dam et al., 2019;
		Document analysis (1)	Manap and Rouhani (2014).
Empirical (40)	Qualitative (16)	Single case study (7)	Özemre & Kabadurmus, 2020; Götz, 2020a; Abed & Chavan, 2019; Khanagha et al., 2018; Kim & Seo, 2018; Lv & Lin, 2017; Kim, Torneo, & Yang, 2019.
		Two case studies (4)	Ahokangas et al., 2014; He & Wang, 2015; Kaivo-Oja et al., 2018; Q. Li, Luo, et al., 2015.
		Interviews (5)	Hannibal, 2020; Götz, 2019; Neubert, 2018; Szalavetz, 2019a; Szalavetz, 2019b.
	Quantitative (17)	Industrial experiment (1)	Q. Li, Wang, et al., 2015.
		Secondary data (4)	Ancarani & Di Mauro, 2018; Ancarani et al., 2019; Banga, 2019; Cameron et al., 2017.
		Surveys (12)	Szász et al., 2020; Stentoft et al., 2020; Naglič et al., 2020; Cheng et al., 2020; Dachs et al., 2019; Del Giudice et al., 2019; Hosseini et al., 2019; Luftman et al., 2015; Majeed & Rupasinghe, 2017; Mangal & Karmarkar, 2012; Raymond et al., 2015; Kostin, 2018.
	Mixed-methods (7)	Case studies and interviews (4)	Schmidt et al., 2020; Calof & Viviers, 2020; Horváth & Szabó, 2019; Chang & Yeh, 2018.
		Interviews and surveys (3)	Makris et al., 2019; Matias & Hernandez, 2019; Sousa, 2018.

Table 3
Industry 4.0, CPS, and CPPS, and technologies 4.0 considered by the sampled studies.

Industry 4.0, CPS and CPPS and technologies 4.0	Authors' name, year	N. of articles referenced
Industry 4.0	Ancarani & Di Mauro, 2018; Ancarani et al., 2019; Banga, 2019; Barbieri et al., 2018; Chang & Yeh, 2018; Dachs et al., 2019; Dzwigol et al., 2020; Eden, 2018; Götz, 2020b; Götz, 2020a; Götz, 2019; Horváth & Szabó, 2019; Kim, Torneo, & Yang, 2019; Kaivo-Oja et al., 2018; Kenney et al., 2015; Kim & Seo, 2018; Kim, Torneo, & Yang, 2019; Kostin, 2018; Q. Li, Wang, et al., 2015; Lv & Lin, 2017; Naglič et al., 2020; Schmidt et al., 2020; Stentoft et al., 2020; Szász et al., 2020; Szalavetz, 2019b.	25
Cloud	Abed & Chavan, 2019; Ahokangas et al., 2014; He & Wang, 2015; Hmood & Ai-Madi, 2013; Jovanović & Đoković, 2016; Q. Li, Luo, et al., 2015; Manap & Rouhani, 2014; Mangal & Karmarkar, 2012; Matias & Hernandez, 2019.	9
Additive manufacturing	Attaran, 2017; Hannibal, 2020; Hannibal & Knight, 2018; Laplume et al., 2016; Mohr & Khan, 2015.	5
Big data	Calof & Viviers, 2020; Özemre & Kabadurmus, 2020; Cameron et al., 2017; Dam et al., 2019.	4
Advanced manufacturing	Raymond et al., 2015; Szalavetz, 2019a.	2
IoT	Sousa (2018).	1
Big data, Cloud, IoT and ERP	Choi (2018).	1
Virtual reality and augmented reality	Del Giudice et al. (2019).	1
Advanced manufacturing and CPS	Gružauskas et al., 2017.	1
Cloud and CPS	Hosseini et al., 2019; Khanagha et al., 2018.	2
Cloud, ERP, Cyber-security	Luftman et al. (2015).	1
ERP, IoT and Industry 4.0	Majeed and Rupasinghe (2017).	1
Industry 4.0 and advanced manufacturing	Sinkovics and Sinkovics (2020)	1
Big data, Cloud and additive manufacturing	Makris et al. (2019).	1
Big data and Cloud	Neubert (2018).	1
Big data and Business intelligence	Cheng, Zhong & Cao	1
IoT, Big data and additive manufacturing	Strange and Zucchella (2017).	1
IoT, Cloud computing, advanced manufacturing, additive manufacturing	Eden (2016)	1
Total		59

combination with other technologies by 5 studies), additive manufacturing (5 studies analyze this technology alone, and 3 studies analyze it in combination with other technologies), and advanced manufacturing (2 studies analyze it in isolation, and 3 studies analyze it in combination with other technologies). The choice of analyzing different technologies separately is based on the characteristics of each technology and industry. All technologies are not employed in all industries. For example, additive manufacturing cannot be used in industries using natural materials such as wood, while it is one of the most widely employed technologies in plastics manufacturing (Laplume, Petersen, & Pearce, 2016).

Table 4 focuses on the direction of causality, namely whether Industry 4.0 drives changes in international business or vice versa. Most studies investigate the effects of Industry 4.0 on international business. The reverse causality is less explored (16 studies). In particular, these articles focus on the impact that different international configurations of companies (MNEs and born global companies, among others) or different markets (developing or developed countries) may have on the choice between different technologies and the performances derived from the application of these technologies.

3.2. Main research streams addressed in the literature

The thematic grid indicates three main research streams addressed by the literature: competitive, organizational, and reverse causality. However, few overlaps may exist between the three research strands.

These research streams are general categories identified in the

Table 4
Direction of causality investigated by the sampled articles.

Direction of causality investigated	Authors name, year	N. of articles referenced
Impact of Industry 4.0 on international business	Ahokhangas et al., 2014; Ancarani & Di Mauro, 2018; Ancarani et al., 2019; Attaran, 2017; Banga, 2019; Barbieri et al., 2018; Calof & Viviers, 2020; Cameron et al., 2017; Cheng et al., 2020; Choi, 2018; Dachs et al., 2019; Dam et al., 2019; Del Giudice et al., 2019; Dzwigol et al., 2020; Eden, 2016; Eden, 2018; Gö; tz, 2020b; Götz, 2019; Gružauskas et al., 2017; Hannibal, 2020; Hannibal & Knight, 2018; Hmood & Ai-Madi, 2013; Hosseini et al., 2019; Jovanović & Đoković, 2016; Kenney et al., 2015; Laplume et al., 2016; Q. Li, Luo, et al., 2015; Q. Li, Wang, et al., 2015; Lv & Lin, 2017; Majeed & Rupasinghe, 2017; Manap & Rouhani, 2014; Mohr & Khan, 2015; Naglič et al., 2020; Neubert, 2018; Ö zemre & Kabadurmus, 2020; Raymond et al., 2015; Schmidt et al., 2020; Sinkovics & Sinkovics, 2020; Stentoft et al., 2020; Sousa, 2018; Strange & Zucchella, 2017; Szalavetz, 2019a; Szalavetz, 2019b.	43
Impact of international business on Industry 4.0	Abed & Chavan, 2019; Chang & Yeh, 2018; Gö;tz, 2020a; He & Wang, 2015; Horváth & Szabó, 2019; Kim, Torneo, & Yang, 2019; Kaivo-Oja et al., 2018; Khanagha et al., 2018; Kim & Seo, 2018; Kim, Torneo, & Yang, 2019; Kostin, 2018; Luftman et al., 2015; Makris et al., 2019; Mangal & Karmarkar, 2012; Matias & Hernandez, 2019; Szász et al., 2020.	16
Total		59

literature based on the same criteria of analysis. The competitive research stream groups all keywords related to the increased/diminished competitiveness of firms adopting Industry 4.0 in international markets. The organizational research stream groups all keywords related to a transformation induced by Industry 4.0 on the international organization of firms in terms of collaboration or competition between firms. Finally, the reverse causality research stream groups all keywords related to the effects of the international configuration of firms – different markets involved (developed or emerging) and different firms' presence at the international level – on Industry 4.0 adoption and performance.

The competitive research stream investigates how firms extend their boundaries beyond their home countries in the Fourth industrial revolution. In particular, it analyzes the role of distance, reshoring/backshoring/nearshoring, decentralization of manufacturing close to the end-user, and international competitiveness.

The organizational research stream explores global value chain reconfigurations, market entry strategies, and examines the role of networks, platforms, and clusters.

The reverse causality research stream examines the influence of international business on Industry 4.0. In this section, we analyze the impact of differences between markets and types of companies on the adoption of 4.0 technologies and the different effects of these adoptions.

These research streams are directly identified through the analysis of the sampled studies. Although based on a subjective classification, this approach seems to best reflect the characteristics of the sampled studies. However, the distinction between the three research streams is not clear-cut, and important nuances and interconnections emerge from the analysis.

Table 5 shows the classification of the articles based on the research streams addressed and the international business domain concerned. The two most explored research streams are the competitive and the organizational ones. The reverse causality research stream is less often explored. The domains related to the international business field are based on our synthesis of the sampled articles. Owing to overlapping, Table 5 contains 59 papers instead of 66, of which few papers address more than one research stream.

The international competitiveness domain comprises studies that analyze fields such as international marketing, international growth, international barriers, globalization, the speed of the internationalization process, the performance of internationalization, and internationalization as a conduct of business transactions across national boundaries, also related to the concept of *internetization* or *cloudification* as a new form of internationalization (Ahokangas, Juntunen, & Myllykoski, 2014).

For the market entry strategies domain, we grouped articles related to international trade, global trade, exports, mergers and acquisitions (M&A), strategic alliances, outsourcing, FDI, and manufacturing subsidiaries. In addition, the cooperation and collaboration domain comprises all articles related to networks, clusters, and platforms.

The international configuration of companies' domain groups together articles dealing with MNEs, SMEs, and born global companies. Finally, the domain of the market comprises studies focused on emerging countries or differences in technology adoption between countries.

Few studies in the domain of the market belong to the domain of international configuration of companies as they analyze emerging market multinationals – EM-MNEs (Matias & Hernandez, 2019). In addition, few studies address more than one research stream. For example, Abed and Chavan (2019) address both the competitive research stream and the reverse causality one. They analyze how the institutional distance between countries is a constraint for cloud computing efficiency. Kaivo-Oja, Knudsen, and Lauraéus (2018) address two research streams. They investigate the nearshoring phenomenon related to location choices (competitive research stream) and also examine the potential of Finland to attract Industry 4.0 investment, thereby improving the information on the reverse causality research stream. Additionally, Gö;tz (2020a) address two research streams that analyze the role of clusters in industry 4.0 adoption (referring to the reverse causality research stream) and shows how industry 4.0 impacts collaboration.

Through thematic analysis, we address the three main research streams identified in the literature (competitive research stream, organizational research stream, and reverse causality research stream) by exploring the relationships between Industry 4.0 and international business. We investigate whether the existing literature agrees on the main effects of these relationships, and, when consensus is not reached, we propose a generalizable solution. The main results of the articles are critically analyzed in the following sections.

3.2.1. *Competitive research stream*

This study identifies 23 articles addressing the competitive research stream.

Abed and Chavan (2019) analyze the role of distance, stating that institutional distance (regulative, normative, and cultural) between countries is a constraint for cloud computing efficiency. The location of production activities in the Fourth industrial revolution is the most debated and controversial theme of the competitive research stream. The effects of Industry 4.0 on location depend on the technologies adopted. In particular, certain advanced manufacturing technologies such as drones, automated guided vehicles, and collaborative robots allow relocation in the home countries. This phenomenon is generally studied under the label of reshoring or back shoring (Ancarani, Di Mauro, & Mascali, 2019). Other technologies, conversely, allow production close to the end user, which is not always in the home country.

Table 5
International business domain addressed by the sampled articles (Sample: 59 articles referenced).

Research stream addressed	International business domain analyzed	Authors name, year	N. of articles referenced
Competitive research stream (23)	Distance	Abed & Chavan, 2019; Eden, 2018.	2
	International competitiveness	Ahokangas et al., 2014; Cheng et al., 2020; Dam et al., 2019; Del Giudice et al., 2019; Dzwigol et al., 2020; Hosseini et al., 2019; Jovanović & Đoković, 2016; Manap & Rouhani, 2014; Naglič et al., 2020; Neubert, 2018; Raymond et al., 2015; Stentoft et al., 2020.	12
	Reshoring/ Backshoring/ Nearshoring	Ancarani & Di Mauro, 2018; Ancarani et al., 2019; Barbieri et al., 2018; Dachs et al., 2019; Kaivo-Oja et al., 2018.	5
	Decentralization of manufacturing close to the end-users	Attaran, 2017; Laplume et al., 2016; Mohr & Khan, 2015; Strange & Zucchella, 2017.	4
Organizational research stream (28)	Market entry strategies	Banga, 2019; Calof & Viviers, 2020; Cameron et al., 2017; Chang & Yeh, 2018; Eden, 2016; Götz, 2020b; Kim, Torneo, & Yang, 2019; Mangal & Karmarkar, 2012; Naglič et al., 2020; Özemre & Kabadurmus, 2020; Sousa, 2018; Szalavetz, 2019a.	12
	Global Value Chains (GVCs)	Choi, 2018; Dzwigol et al., 2020; Hannibal, 2020; Kenney et al., 2015; Laplume et al., 2016; Majeed & Rupasinghe, 2017; Schmidt et al., 2020; Strange & Zucchella, 2017; Szalavetz, 2019b.	9
	Cooperation and collaboration	Götz, 2020a; Götz, 2019; Gružauskas et al., 2017; Hmood & Ai-Madi, 2013; Q. Q. Li, Luo, et al., 2015; Q. Li, Wang, et al., 2015; Sinkovics & Sinkovics, 2020.	7
Reverse causality research stream (15)	International configuration of companies	Götz, 2020a; He & Wang, 2015; Horváth & Szabó, 2019; Hosseini et al., 2019; Khanagha et al., 2018; Lv & Lin, 2017; Makris et al., 2019; Matias & Hernandez, 2019; Szász et al., 2020.	9
	Markets	Kim, Torneo, & Yang, 2019; Kim & Seo, 2018; Kim et al., 2018; Kostin, 2018; Luftman et al., 2015; Matias & Hernandez, 2019.	6
Total			66

Production may be carried out in countries where companies have no subsidiaries, production branches, and distribution centers (Attaran, 2017; Hannibal & Knight, 2018; Laplume et al., 2016).

Moreover, other studies dealing with the competitive research stream investigate the international competitiveness of companies adopting industry 4.0. In particular, some authors argue that Industry 4.0 improves the international growth of companies (Del Giudice et al., 2019) and performance (Raymond, Bergeron, Croteau, & St-Pierre, 2015). Other authors argue that Industry 4.0 partly decreases international information and marketing barriers (Hosseini et al., 2019). Other studies state that Industry 4.0 facilitates the speed of internationalization (Cheng, Zhong, & Cao, 2020).

Finally, Ahokangas et al. (2014: 5) argue that cloud computing may expand companies' boundaries even beyond the concept of internationalization by opening up the virtual dimension. They state that "*cloudification has led to the doubt whether or to what extent it is possible to identify, capture, describe, and explain the specificities of internationalization of cloud businesses by applying the existing conceptions, approaches, or theories of international business and internationalization, even those of e-business*" (p.5).

By critically analyzing the results of the sampled articles, we determine whether the adoption of new 4.0 digital technologies has intensified or whether it has modified the choices related to location and distance, thereby modifying cost-driven motivations (Stentoft, Wickstrøm, Haug, & Philipsen, 2020). In this literature review, both non-empirical and empirical studies agree that Industry 4.0 has introduced new elements that tend to stretch value chains in different directions. However, these directions are neither clear nor unique nor generalizable. Industry 4.0 seems to reduce perceived distance, improving communication between objects, machines, and people, thus allowing wider geographic expansion. The technologies most involved in this process are big data, cloud computing, the Internet of things, and cyber-security that guarantee the secured exchange of information. However, distance is also related to proximity requirements, such as exchanges of technological skills and competencies both for research and development (R&D) and applications in the factory. In the latter case, distance remains a vital element, even after the Forth industrial revolution. Concerning location choices, the different possible directions chosen by companies adopting Industry 4.0 depend on the technologies implemented.

3.2.2. Organizational research stream

The organizational research stream is addressed by 28 studies. In this section, we analyze the impacts of Industry 4.0 on global value chain reconfiguration, market entry strategies, and collaboration between companies.

The global value chain reconfiguration is analyzed by Kenney, Rouvinen, and Zysman (2015) among others. They report that the transformation of computing and communication infrastructure, mainly introduced by cloud computing, has occurred simultaneously with the spread of complicated and sophisticated global value chains. However, it remains unclear how this complexity could be managed by states through social, legal, and economic arrangements. Addressing this issue,

Schmidt, Veile, Müller, and Voigt (2020) propose an ecosystem 4.0 approach to redesign and manage these complex and sophisticated global value chains, while Dzwigol et al. (2020) propose the formation of a globally competitive enterprise environment based on Industry 4.0.

The market entry strategies are mainly analyzed focusing on export activities (Naglič, Tominc, & Logožar, 2020). Cameron, Viviers, and Steenkamp (2017) and Özemre and Kabadurmus (2020) explain the impact of Industry 4.0 on export activities as strictly linked to big data availability (Merchant, 2018). They note that big data may overturn trade decisions both in the quest for new markets and by identifying new product opportunities in existing markets. However, the topic of FDI is analyzed by mainly referring to MNEs (Eden, 2016).

The most relevant topic is the impact of Industry 4.0 on the collaboration and cooperation between companies (Q. Li, Wang, Cao, Du, & Luo, 2015). Existing literature shows how networks are increasingly used to overcome barriers related to scarce resources (Coviello & Cox, 2006) or knowledge of new markets (Lu, Zhou, Bruton, & Li, 2010) benefitting from partner contacts especially for early internationalizers (Bembom & Schwens, 2018). Digitalization and Industry 4.0 have further developed the so-called platform economies (Sinkovics & Sinkovics, 2020), improving inter-and intra-industry networks (Q. Li, Luo, Xie, Feng, & Du, 2015) and creating shared platforms between companies. Digital platforms allow high scalability and reinforce network effects increasing the firms' growth quickly. This happens because platform firms realize much higher net income and equity per employee than non-platform firms (Verhoef et al., 2019).

By critically analyzing whether firms that have adopted Industry 4.0 transform or rather maintain their organization of business, as usual, we show that liberalization, deregulation, and the spread of information and communication technologies have radically changed the configuration of the value chain. These phenomena also affect the way how different MNEs operate and compete in the global world (Kano et al., 2020), allowing a greater breadth and decentralization of production. MNEs increasingly integrate their internationally dispersed strategic partners, specialized suppliers, and customers, creating the so-called global value chain, global commodity chains (Bair, 2009; Gereffi, 2018), and global production networks (Coe & Yeung, 2015, 2019; Henderson, Dicken, Hess, Coe, & Yeung, 2002; Rehnberg & Ponte, 2016; Yeung, 2009, 2018, pp. 382–406). These new global value chains are governance arrangements that utilize multiple governance modes within a single structure for distinct, geographically dispersed, and finely sliced parts of the value chain, built on firm-specific coordination and inter-and intra-firm cooperation strategies rather than linear chains (Kano et al., 2020). In addition, the organizational changes required at the state level are extensive, as a large amount of information, products, and services exchanged globally implies that new regulations and unambiguous standards are needed. Finally, Industry 4.0 has enabled the *platformization*, a "*shift from individual products or services to platforms, as the basis for offering value*" (Nambisan, Zahra, & Luo, 2019, p. 2). This phenomenon is the main revolution in the organizational research stream. It is not only a reconfiguration but a completely new business model. Concerning the competitive research stream, Industry 4.0 takes international business in two opposite directions. On the one hand, platforms and ecosystems allow young and small firms to access infrastructures, allowing them to quickly reach customers worldwide (Nambisan et al., 2019) while reducing barriers for advanced emerging economies to reach end-customers (Li, Frederick, & Gereffi, 2019). On the other hand, platformization might disadvantage or exclude actors located away from innovation hubs (Kano et al., 2020), providing new relevance to the concept of distance.

3.2.3. Reverse causality research stream

Finally, 15 studies investigate the reverse causality research stream. This research stream relates to the impact that different international configurations of companies (MNEs, and born global companies, among others) or different markets (developing or developed countries) may have on the choice between different technologies and the performances derived from the application of these technologies.

Regarding the different international configurations of companies, few authors focus on how MNEs deal with technological adoption (Khanagha et al., 2018; Makris, Hansen, & Khan, 2019), or more specifically on how MNEs address cloud adoption (He & Wang, 2015), implicitly hypothesizing that these companies use different modalities from those adopted by SMEs. Horváth and Szabó (2019) highlight that MNEs and SMEs experience different impacts of the driving forces and barriers to Industry 4.0 adoption. In particular, they suggest that MNEs experience higher driving forces and lower barriers than SMEs in nearly every aspect. Concerning different markets, some studies investigate how global similarities and differences in technology trends (e.g., management concerns, influential technologies, budgets/spending, and organizational considerations) in different geographies exert a different impact on the implementation of Industry 4.0 (Luftman et al., 2015). Other studies address specific countries, such as emerging economies, investigating how the competitive pressure and regulatory support drive firms to adopt cloud computing, especially in third-world countries (Matias & Hernandez, 2019).

In the critical analysis of the reverse causality research stream, the literature investigates whether and how international businesses have an active role in the Fourth industrial revolution. The international configuration of companies and differences between markets seem to significantly influence digital transformation. These elements affect the choice between different technologies, increasing, for example, the need for data-related technologies to coordinate geographic expansion but also for virtual reality technologies to improve e-learning and maintenance, as well as advanced manufacturing technologies to better manage the global distribution of products. In addition, international configurations may change the performances of the adopted technologies and the speed of their global spread, as well as leveraging the diffusion of these technologies along the supply chain to benefit from the network effect, which is typical of connection-related technologies (Szász, Demeter, Rácz, & Losonci, 2020).

3.3. Research agenda: the TCCM framework

Prior studies have examined the mutual relationships between industry 4.0 and international business, showing a rise in the number of papers (Fig. 4) and the bidirectional relationships between industry 4.0 and international business. The literature on the topic addresses three research streams: competitive, organizational, and reverse causality. However, the literature appears to lack an unambiguous view on the transformations introduced by Industry 4.0 on international business and vice versa. Future research should be designed to analyze the numerous combinations of 4.0 technologies and their impact on different countries and industries. Early works in this area focused more on firms from developed countries and analyzed a limited combination of technologies in manufacturing, avoiding a detailed analysis of different industries (Büchi, Cugno, & Castagnoli, 2020). In the following sections, the existing knowledge gaps and the direction for future research are presented using the TCCM framework, useful to develop theoretical highlights in a clear, incisive, and comprehensive way (Paul, Merchant, Dwivedi, & Rose, 2021; Paul & Rosado-Serrano, 2020).

The following section identifies the gaps in the literature for future research, thereby answering RQ3.

3.3.1. Theory development (T)

The systematic literature review shows that existing studies on the topic address different domains of international business through exploratory analysis. However, the lack of a strong theoretical reference is observed. This shortcoming could partly be related to the relatively recent development of Industry 4.0, making in-depth analysis difficult, and the relevance of the resulting transformations in international business. The extent of this change seems to suggest that traditional

theories of international business are not well-adapted to the new context.

Buckley, Doh, and Benischke (2017) suggest that international business needs close interaction between theoretical and empirical perspectives to avoid becoming an area of application for applied concepts from other disciplines. This risk is reflected in the existing literature on Industry 4.0 and international business, which seems to mainly focus on 4.0 technologies without a precise reference to international business theories.

Future research should refer to established theories that jointly analyze different domains of international business. We suggest further research to explore how Industry 4.0 could change the role of international business focusing on three main underexplored aspects.

Process and pace of internationalization. The first aspect concerns the need for studies analyzing whether industry 4.0 is leaning toward the International New Ventures (INV) model, with internationalization since inception (Oviatt & McDougall, 2005), or towards the Uppsala (U) model, with gradual internationalization (Johanson & Vahlne, 1977). The concept of born global (Eden, 2016; Weerawardena, Mort, Liesch, & Knight, 2007), particularly born digital (Johanson & Vahlne, 2009), leans towards the INV model. However, not all these firms internationalize immediately and expand rapidly (Monaghan et al., 2020). In this regard, a further theory, the Born-Again-Global model (Bell, McNaughton, & Young, 2001; Bell, Mcnaughton, Young, & Crick, 2003; Morais & Ferreira, 2020) leads to a possible merger of the U model and INV model. According to this model, SMEs typically take root in their domestic market and quite suddenly embark on internationalization related activities.

To this distinction, the difference between traditional companies that convert to Industry 4.0 and companies that are born 4.0 must be added (this aspect is also clearly linked to a sector issue; see section 4.2). Eden (2018) makes a distinction between "*old and new firms*" based on the adoption of new technologies by arguing that "*old firms are often disadvantaged, hampered by old ways of doing things*" (p.32), whereas new and more flexible firms are most likely to survive. However, new entrants often endure various liabilities, particularly where institutional distances are large. Hence, the winners and losers are often not distinct and future studies should focus on this.

Distance. The second aspect concerns whether Industry 4.0 abolishes, or at least transforms, the various forms of distance typically expressed within the Cultural, Administrative, Geographic and Economic (CAGE) distance framework (Ghemawat, 2007). The role of distance is being shaped by networks that are increasing with the rise of technologies. To analyze this, studies should be conducted on the impact of technologies on the role and configuration of globally competitive enterprises (Dzwigol et al., 2020).

Ownership. The third aspect concerns whether Industry 4.0 will make companies lean towards new forms of ownership linked to *platformization* models (Gawer & Cusumano, 2014).

These new business models, indeed, are considered much less based upon control by Foreign Direct Investments (FDIs) and much more upon the orchestration of assets through information networks (Marano, Tallman, & Teegen, 2020). In this analysis, it is also necessary to consider how Industry 4.0 modifies the concept and the role of ownership as a prerequisite to overcoming the liability of foreignness (Dunning, 1988).

3.3.2. Context (C)

The following underexplored contexts should be analyzed: geographic context, industrial context, and time context.

Geographic context. Although the sampled studies show different and fragmented results, most studies focus on developed countries, while only four studies out of 59 analyze the transformations taking place in developing countries. The adoption of 4.0 technologies may be particularly challenging for emerging countries (Kumar & Siddharthan, 2013) as such economies typically engage in the extraction and commercialization of raw materials, and companies are lagging in terms of Industry 4.0 adoption compared to developed countries (Castellacci, 2008). Emerging economies have unique features in terms of economic infrastructure, culture, level of education, and economic and political stability that may interfere with the perception of the potential of and investment in advanced technologies (Frank, Cortimiglia, Ribeiro, & de Oliveira, 2016).

Industrial context. The industries to which companies belong influence the Industry 4.0 adoption strategies. Literature shows that depending on the industry, firms adopt some 4.0 technologies instead of others. For example, additive manufacturing is the most widely employed technology in plastics manufacturing (Laplume et al., 2016).

The difference between knowledge-intensive and labor-intensive industries should also be analyzed (Paul & Rosado-Serrano, 2019). From one side, advanced manufacturing allows high automation thereby reducing workforce costs (Strange & Zucchella, 2017). Therefore, Industry 4.0 is ideal for labor-intensive industries. On the other side, Industry 4.0 is based on data exchanges within and beyond the firm (Choi, 2018; Jovanović & Đoković, 2016) and improving the role of knowledge both in knowledge-intensive and labor-intensive industries.

Time context. The literature shows that Industry 4.0 impacts strategic management in the long run. It might also shape international business in the long run with different effects depending on 4.0 technologies, firms' characteristics, and industries.

3.3.3. Characteristics (C)

The following characteristics of Industry 4.0 and international business should be analyzed: antecedents, moderators/mediators, outcomes.

Antecedents. Few sampled studies focus on the antecedents of Industry 4.0 adoption and internationalization processes. In this section, we analyze both the effects of international business on Industry 4.0 and the effects of Industry 4.0 on international business.

The reverse causality research stream is the least studied of the three research streams addressed by the literature. Future studies should examine how the different international configurations of companies (MNEs, born global firms, and global startups, among others) and their location in different countries (developed, emerging, and with high technological potential, among others) can influence choices in the 4.0 technologies adoption and the related opportunities. Many studies analyze MNEs and SMEs separately, while only one article out of 59 (Horváth & Szabó, 2019) compares them by investigating the different effects of MNEs or SMEs on the driving forces and barriers to Industry 4.0 adoption.

On the contrary, the antecedents of the relationships from Industry 4.0 to international business receive more attention. However, we observed a limited focus on the driving forces and barriers that Industry 4.0 introduces in internationalization processes. It is widely accepted that different technological advantages generate different effects on international business (Yip, 1994). Both the characteristics of 4.0 technologies and the complexity of the 4.0 environment suggest a potentially different impact on these relationships that deserves to be studied in depth.

Moderators/mediators. Cuervo-Cazurra, Mudambi, Pedersen, and Piscitello (2017) remind us that two drivers transform international business: technological advances and institutional change. Technological advances push the global exchange of goods, services, and information. Institutional change can sometimes slow down, reverse and dampen the process of globalization. Some authors stress that consumer behavior (Castagnoli, Büchi, & Cugno, 2020, pp. 21–36; Dwivedi et al., 2020) and their engagement or disengagement in the use of digital technologies (Jain, Merchant, Deshmukh, & Ganesh, 2018, pp. 573–574) influence the diffusion and performance of technologies. Flores et al. (2020) and Gómez and Vargas (2012) highlight how the roles and skills of employees affect the performance of Industry 4.0. It is therefore necessary to investigate whether institutions, customers, and

employees have a moderating or mediating role in the relationships between Industry 4.0 and international business.

Outcomes. The creation of networks and platforms on a global scale, which may revolutionize international relations and supply chains, deserves special attention in future research. These new collaborative forms allowed by 4.0 technologies intensify intra- and inter-industry relations. It is necessary to analyze whether MNEs change their choices in terms of foreign direct investments by making the role of service platforms and horizontal collaboration between companies and customers prevail (Marano et al., 2020).

Industry 4.0 improves firms' competitiveness and global productivity (Kagermann et al., 2013). However, it is necessary to investigate whether and how Industry 4.0 changes the concept of Firm-Specific Advantages (FSAs).

The sample of papers analyzed shows two ambivalent directions regarding the dynamics of localization. Some studies focus on the possibility of reshoring production activities. This is made possible by the introduction of advanced manufacturing technologies that eliminate the need to relocate production to countries with low labor costs (Albertoni, Elia, & Piscitello, 2015, pp. 1–22). Others highlight the possibility of carrying out production in a decentralized manner by producing close to the end user (Hannibal & Knight, 2018). It is, therefore, necessary to analyze which of the two directions prevails, and in which sectors.

Finally, the effects of some 4.0 technologies on international business remain almost unexplored. Few studies are conducted on augmented/diminished/virtual reality, the Internet of things, simulation, and horizontal and vertical integration.

3.3.4. Methodology (M)

Existing studies explore the topic using both non-empirical and empirical approaches (Table 2), although some research gaps exist. From individual case studies, the literature has moved towards increased analyses of large-scale samples (Szász et al., 2020) using regression methods (Stentoft et al., 2020). The challenge is to develop surveys that evaluate the determinants and results of the phenomenon through representative samples.

This study offers valuable recommendations on the sample selection, data collection, and analytical tools that may be used to improve the methodological rigor of the research process.

Sample and data. In qualitative studies, the characteristics, antecedents, and performance of the relation of interest should be examined using multiple case studies. In quantitative studies, representative samples are needed, taking into account different characteristics of the firms in terms of industry, firm size, and degree of internationalization. Morais and Ferreira (2020) highlight that the small size of the company, for example, can change three main areas of internationalization: internationalization process; specific factors/variables influencing internationalization; internationalization, and performance.

To the best of our knowledge, no autonomous data collection has been conducted in empirical studies on the relationships between Industry 4.0 and international business. The information used in the referenced studies is based on primary data collected by institutions/researchers.

Analytical tools. The systematic literature review shows that the most widely used methods are case studies and surveys. Mixed methods are used only in a limited way. Quantitative studies use little multidimensional analysis. Regression analysis, structural equation modeling, and spatial analysis should be used more extensively. The relationship between international business and several 4.0 technologies should be jointly considered. Moreover, a comparison of the relations between Industry 4.0 and international business in different countries has not yet been carried out. At present, the problem of causality assessment between Industry 4.0 and international business remains an open question. Therefore, the question is how to operationalize concepts, identify key variables and measure the effects in the medium and long run. In this assessment, it is necessary to develop multilevel studies comparing the local/global level or the different functional areas (Peterson, Arregle, & Martin, 2012).

4. Discussion

The systematic literature review – through the analysis of theoretical, contextual, related to characteristics and methodological aspects of the sample of papers (Canabal & White, 2008; Hao, Paul, Trott, Guo, & Wu, 2019; Paul & Criado, 2020) – has highlighted the relevance of the phenomenon and the existence of bidirectional relationships between Industry 4.0 and international business, identifying literature that is still fragmented and with sometimes contrasting results.

From the analysis of knowledge gaps and conflicting results present in the literature to date, we outline six propositions that can be used as hypotheses to be tested in future research: the development of location choices, changes in the role of ownership, international trade evolution, differences in firms' characteristics, differences in country characteristics, and the process and pace of internationalization.

Fig. 5 summarizes the propositions for future research on Industry 4.0 and international business explained in detail in the following sections. Industry 4.0 is declined in four dimensions: Industry 4.0 development; firms' capability to readily invest in Industry 4.0; higher performance from Industry 4.0 adoption; technologies 4.0 adoption. International business is declined in seven dimensions: location choices based on knowledge factors; network expansion, the role of ownership, international trade of information goods; faster internationalization; EM-MNEs; Firms' international expansion. The six propositions for future lines of research are reported in the central part of 5,. 5,.

Propositions P2, P5, and P6 allow us to bridge a knowledge gap, while P1, P3, and P4 allow us to overcome a contrast present in the current literature.

Propositions P1, P2, P3, and P6 deal with the effect of Industry 4.0 on international business, while propositions P4 and P5 deal with the effect of international business on Industry 4.0. Most of the propositions identify a positive correlation between Industry 4.0 and international business, except for propositions P2 and P4 that show a positive and a negative correlation depending on the elements considered.

4.1. Development of location choices

Within the literature on the competitive research stream, a contrasting result emerges related to the location of production activities. Literature shows an ambivalent direction of the future of a firm's location choices depending on the technology adopted.

In particular, some authors (Ancarani et al., 2019) suggest that some 4.0 technologies allow a relocation in the home countries (generally studied under the label of reshoring or back shoring). Other authors (Attaran, 2017; Hannibal & Knight, 2018; Laplume et al., 2016), conversely, contend that few 4.0 technologies allow production close to the end-user. This difference seems to depend on the 4.0 technologies adopted. In the former case, relocation to the country of origin may depend on the adoption of advanced manufacturing technologies such as drones, automated guided vehicles, and collaborative robots, which can reduce labor costs, allowing the management of the relationships with customers at a distance. The latter case may depend on additive manufacturing technologies, which allow the decentralization of production activities. It is conceivable that, in the future, the choice of location will be more driven by knowledge factors than by cost factors (at least, knowledge factors will in any case affect choices based on cost factors). The key issue of sourcing knowledge across the border would then be a critical driver of competitive advantage. Hence, this study posits the following proposition:

P1. *The development of Industry 4.0 will orient location choices more towards knowledge factors.*

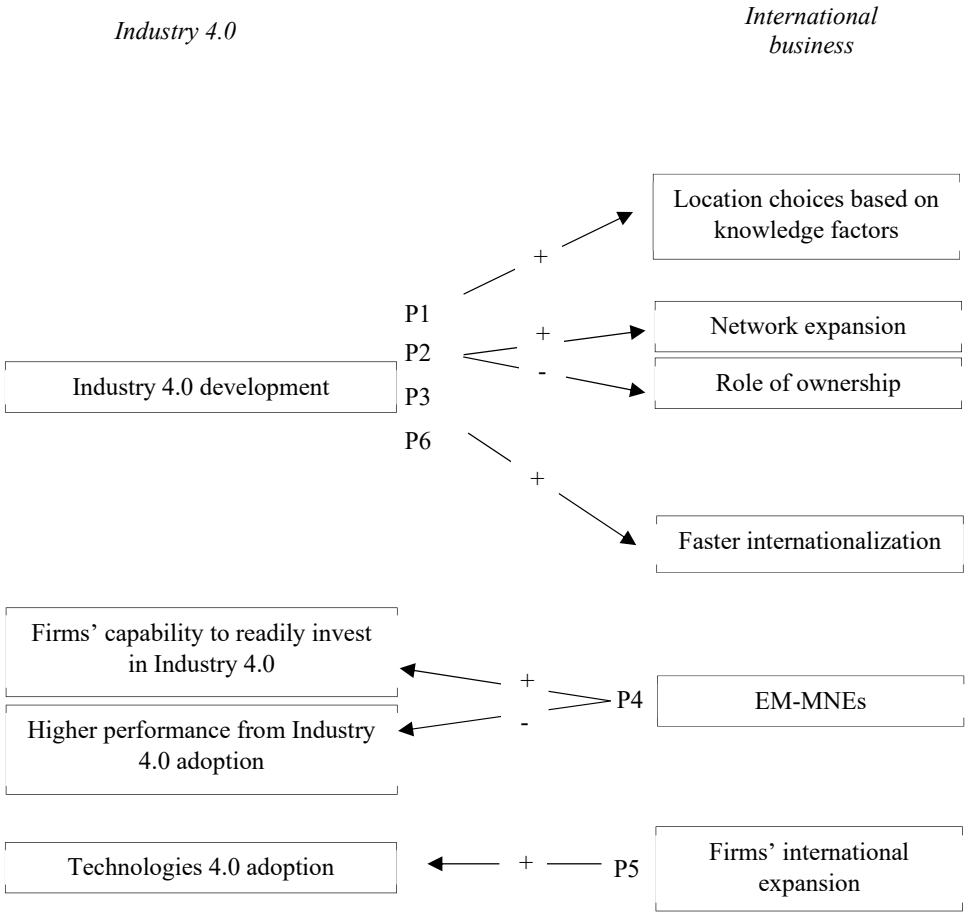

Fig. 5. Relationships between Industry 4.0 and international business.

4.2. Changes in the role of ownership

In the literature, there is a gap related to theoretical debates on the following question: will Industry 4.0 make firms lean towards new forms of ownership related to new platformization models (Gawer & Cusumano, 2014) instead of traditional FDIs?

The systematic literature review shows that Industry 4.0 creates an environment that favors the integration of production, without interruption, within and beyond the boundaries of the company, at the inter- and intra-industry levels, and along the supply chain. This integration occurs through the interconnection between production systems and the exchange of knowledge and skills between production structures and different companies (Büchi, Cugno, & Castagnoli, 2018; Kenney et al., 2015; Q.; Li, Luo, et al., 2015; Q.; Li, Wang, et al., 2015). This process involves more countries and activities upstream and downstream of the supply chain. Hence, the following proposition is proposed:

P2. *The development of Industry 4.0 will favor more network expansion and reduce the role of ownership in MNEs strategies.*

4.3. International trade evolution

Within the literature on the competitive research stream, a contrasting result emerges related to the change in international trade. Industry 4.0 and information technologies transform international trade, reducing information costs and globally expanding the exchange of data on customers' preferences. However, the question of the nature of future international trade remains unsolved and consensus remains elusive Some authors state that international trade will be more oriented on the exchange of knowledge (Banga, 2019), while other authors believe that the future of international trade will be both based on the exchange of goods and of knowledge (Dam et al., 2019). In particular, few industry 4.0 technologies provide more information about customers. The collected information may enable companies to enter global markets with lower information costs. Porter and Heppelmann (2014) contend that industry 4.0 technologies allow the traceability of products. This aspect may increase international purchases of products, reducing the problem of the country's image due to counterfeit products (Papadopoulos & Heslop, 2014). With the development of Industry 4.0, the value of exchange tends to shift from the production of products and services to the production of the codes enabling this production. The increased exchange of data and knowledge at a global level can partly replace the exchange of goods and services or increase independently of them.

P3. *The development of Industry 4.0 orient international trade more towards exchanges of information goods (to the detriment of products and services).*

4.4. Differences in countries characteristics

Within the literature on the reverse causality research stream, a contrasting result emerges related to the role of the international configuration of companies in Industry 4.0 adoption and performance. However, there are different points of view in the literature on this topic. It is, therefore, crucial to analyze whether emerging countries represent more of an opportunity or a barrier for Industry 4.0 adoption and implementation. The location of a company in a developed or an emerging country has different effects on Industry 4.0 performance because of different efficiencies of infrastructure, economics, and ecosystems (Luftman et al., 2015; Raj et al., 2020). Regarding the effects of

international business on industry 4.0 in emerging economies, the existence of an ambivalent relationship between EM-MNEs and industry 4.0, with a positive effect on firms' capability to invest readily in industry 4.0 and a negative effect on higher performance from industry 4.0 adoption (P4), can be assumed. Firms from emerging countries tend to invest in cutting-edge technologies and can do it faster than companies in developed countries because they do not have to bear the costs of transition that incumbents with installed capabilities must manage. In this sense, this study posits the following proposition:

P4. *The MNEs from emerging countries may have the capability to invest faster in Industry 4.0 and achieve higher performance.*

4.5. Differences in firm's characteristics

From the analysis of selected articles, a knowledge gap related to the antecedents of Industry 4.0 adoption emerges. The literature agrees that firms' characteristics are crucial in Industry 4.0 adoption. However, there is no clear understanding of which kind of firms – SMEs or larger firms – have more driving force for Industry 4.0 adoption. Large enterprises and SMEs have different impacts on the driving forces and barriers to Industry 4.0 adoption (Horváth & Szabó, 2019). The diversity and openness of Industry 4.0 make it possible for even very young start-ups to search for international opportunities very quickly and the intensive use of information may seriously limit the liability of foreignness for the smaller start-ups. Therefore, this study posits the following proposition:

P5. *The international expansion of Industry 4.0 based ventures will emerge as a key driver for the adoption of 4.0 technologies across borders.*

4.6. Process and pace of internationalization

In the extant literature, there is a gap related to theoretical debates on the models of internationalization that will prevail in the future of international business following the adoption of 4.0 technologies (Paul & Rosado-Serrano, 2019). Recently, the emergence of born-digital firms, offering value propositions primarily based on digital technologies and early internationalization (Monaghan et al., 2020) have attracted the attention of many academics (Monaghan et al., 2020; Weerawardena et al., 2007). Thanks to 4.0 technologies, manufacturing capacity is being recombined with digital components to offer renewed value propositions that are often based on big data analytics (Calof & Viviers, 2020). The Internet of Things also helps to improve the efficiency and effectiveness of logistics and accurately monitor operations in the transit of goods along the global value chain. Furthermore, additive manufacturing technologies enable production sites to be located differently, often in a decentralized manner (Hannibal, 2018, 2020). The extent to which 4.0 technologies are implemented along with the reorganization of organizational procedures, allows for changes in the type of process and pace at which firms can enter international markets (Lu, 2017). This early competition in the international market leads to two main transformations in international business theories. First, it leads to the advancement of the INV model (Paul & Rosado-Serrano, 2019) and accelerated internationalization by born global (Weerawardena et al., 2007) and born-digital firms (Monaghan et al., 2020). Second, it expedites the U model. Therefore, this study posits the following proposition:

P6. *The development of Industry 4.0 will accelerate the internationalization of firms.*

5. Conclusion

The objective of the study was to reconstruct a systematic literature review on the relationship between Industry 4.0 and international business by identifying salient characteristics of the articles contributing to the development of the topic; new research streams addressed on the topic, and to uncover gaps for future research.

The research was carried out on a sample of 59 studies published in management journals listed in the Academic Journal Guide 2018 by Chartered ABS. The analysis shows that the relationship between Industry 4.0 and international business has attracted growing interest since 2016. Various studies analyze the topic through qualitative and quantitative approaches, mainly carrying out single/two case studies and surveys, while few studies adopt mixed methods. In addition, most studies focus on a limited number of 4.0 technologies.

The analysis shows a strong reciprocal relationship between Industry 4.0 adoption and internationalization addressed by existing literature in three main research streams: competitive, organizational, and reverse causality. The competitive research stream focuses on Industry 4.0 changes in the role of distance, international competitiveness, and location choices of companies in two different directions depending on the technologies adopted (in the country of origin or the country of the final destination of products). The organizational research stream shows that Industry 4.0 modifies market entry strategies, global value chains, and inter- and intra-industry collaboration and cooperation by strengthening and facilitating the global management of firms. The reverse causality research stream analyses the topic from the opposite perspective, investigating the effects of the different configurations of companies at an international level on the choices and opportunities for the adoption of Industry 4.0.

Gaps were identified through a Theory, Context Characteristics, Method framework (TCCM). Within theory development, three areas are identified, namely, process and pace of internationalization, new forms of distance, and new shapes of ownership. Within context, three gaps are identified, which are geographic, industrial, and time context. Within characteristics, three gaps are identified, namely, antecedents, mediators/moderators, and outcomes. Finally, within the methodology, the gaps identified are related to the sample and data and analytical tools.

Finally, the paper identifies six emerging themes in the literature on international business development presenting strong contrasts and unsolved debates. These areas are developed into six propositions to be verified in future research, summarized into six main areas: (i) the development of location choices based on knowledge factors; (ii) changes in the role of ownership in favor of network expansion and platformization phenomenon, (iii) international trade evolution moving more towards exchanges of information goods; (iv) differences in country characteristics looking at the potential capability of MNEs from emerging countries to invest faster in Industry 4.0; (v) differences in firms' characteristics looking at the international expansion of Industry 4.0 based ventures as a key driver for the adoption of 4.0 technologies across borders; (vi) the acceleration in process and pace of internationalization.

In conclusion, this study contributes to the literature on the topic by highlighting that the two phenomena of Industry 4.0 and international business have a two-way directional relationship, bringing relevant transformations in both fields. Moreover, the research shows that existing studies present differences in the several directions of these transformations. It also points out that these diverging opinions existing in the literature, depend on different firms' characteristics, different countries involved in the process, and different technologies adopted. From these considerations, the paper identifies six main areas of future research, hypothesizing some possible directions that might prevail in the next years.

5.1. Managerial implications

While primarily a guide for academic research to identify the state of the art and the future lines of research, this review may also function as a practical guide for managers who do international business in the context of Industry 4.0 and for policy makers dealing with systems-oriented measures.

The study suggests that managers should consider that firms adopting Industry 4.0 may internationalize faster and sooner, due to remote

access to knowledge of foreign markets, better global value chain management, and more effective relationships with customers, employees, and suppliers. In addition, the study indicates that a firm's international configuration (i.e., the countries in which it is located and the degree of its global presence) might affect the degree of Industry 4.0 adoption, the kind of technologies adopted, and the relative performance. Finally, the study highlights the mutual influences between industry 4.0 and international business. Managers should consequently change the decision-making process (Vlacic, González-Loureiro, & Eduardsen, 2019, 2020) to jointly consider international strategies and technology adoption shaping and influencing each other.

Furthermore, it is useful to consider that the transformations that occur at the firms' level require policies that consider the phenomenon in a joint manner, highlighting the need for the creation of knowledge, infrastructure, and ecosystems to facilitate these transformations.

5.2. Limitations

The sample of referenced studies is composed of 59 studies. These consist of a solid base of 13 high-quality papers published in journals included in the upper ABS list (3, 4, 4*) and 19 quality papers published in journals marked 1 and 2 in the ABS list. This is complemented by 27 papers published in journals of quality, rigor, and scientific interest—measured by H index, SCImago Journal Rank, and Impact Factor—and two peer-reviewed book chapters. This sample composition allows us to fully investigate the transformations of Industry 4.0 and international business.

Since the analyzed topic is an emerging theme, the number of works should not come as a surprise. However, since many studies conducted on the topic have not been published yet in high-profile journals, the systematic literature review should also address studies published on proceedings and book chapters. However, this choice was discarded in this study to derive the most rigorous research outcomes.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgements

The authors would like to thank Editors and Reviewersof European Management Journal for their precious suggestions.

Appendix A. List of 59 articles analyzed for the literature review (Authors name, year)

Abed and Chavan (2019)	Kenney et al. (2015)
Ahokangas et al. (2014)	Khanagha et al. (2018)
Ancarani and Di Mauro (2018)	Kim, Abe, and Valente (2019)
Ancarani et al. (2019)	Kim and Seo (2018)
Attaran (2017)	Kim, Torneo, & Yang (2018)
Banga (2019)	Kostin (2018)
Barbieri et al. (2018)	Laplume et al. (2016)
Calof and Viviers (2020)	Li, Luo, Xie, Feng, and Du (2015)
Cameron et al. (2017)	Li, Wang, Cao, Du, and Luo (2015)
Chang and Yeh (2018)	Luftman et al. (2015)
Cheng et al. (2020)	Lv and Lin (2017)
Choi (2018)	Majeed and Rupasinghe (2017)
Dachs et al. (2019)	Makris et al. (2019)
Dam et al. (2019)	Manap and Rouhani (2014)
Del Giudice et al. (2019)	Mangal and Karmarkar (2012)
Dzwigol et al. (2020)	Matias and Hernandez (2019)
Eden (2016)	Mohr and Khan (2015)
Eden (2018)	Naglič et al. (2020)
Götz (2020a)	Neubert (2018)
Götz (2020b)	Özemre and Kabadurmus (2020)
Götz (2019)	Raymond, Bergeron, Croteau, & St-Pierre (2015)
Gružauskas et al. (2017)	Schmidt et al. (2020)
Hannibal (2020)	Sinkovics and Sinkovics (2020)
Hannibal and Knight (2018)	Stentoft et al. (2020)
He and Wang (2015)	Sousa (2018)
Hmood and Al-Madi (2013)	Strange and Zucchella (2017)
Horváth and Szabó (2019)	Szalavetz (2019a)
Hosseini et al. (2019)	Szalavetz (2019b)
Jovanović and Đoković (2016)	Szász et al. (2020)
Kaivo-Oja & Lauraeus (2018)	

References

ABDI - Agência Brasileira de Desenvolvimento Industrial. (2017). *Inovação, Manufatura Avançada e o Futuro da Indústria* (Vol. 1).

Abed, Y., & Chavan, M. (2019). The challenges of institutional distance: Data privacy issues in cloud computing. *Science Technology & Society, 24*(1), 161–181.

Ahokangas, P., Juntunen, M., & Myllykoski, J. (2014). Cloud computing and transformation of international e-business models. In *Competence-based management, A focused issue on building new competences in dynamic environments* (Vol. 7, pp. 3–28). Emerald Group Publishing Limited.

Albertoni, F., Elia, S., & Piscitello, L. (2015). Re-configuration of the value chain: The back shoring of business services. *XXVI riunione scientifica annuale associazione italiana di Ingegneria gestionale*.

Ancarani, A., & Di Mauro, C. (2018). Reshoring and industry 4.0: How often do they go together? *IEEE Engineering Management Review, 46*(2), 87–96.

Ancarani, A., Di Mauro, C., & Mascali, F. (2019). Backshoring strategy and the adoption of industry 4.0: Evidence from europe. *Journal of World Business, 54*(4), 360–371.

Attaran, M. (2017). The rise of 3-D printing: The advantages of additive manufacturing over traditional manufacturing. *Business Horizons, 60*(5), 677–688.

Bair, J. (2009). Global commodity chains. *Frontiers of commodity chain research*, 1–34 (Stanford University Press).

Banga, R. (2019). Is India digitally prepared for international trade? *Economic and Political Weekly, 54*(5).

Barbieri, P., Ciabuschi, F., Fratocchi, L., & Vignoli, M. (2018). What do we know about manufacturing reshoring? *Journal of Global Operations and Strategic Sourcing, 11*(1), 79–122.

Bell, J., McNaughton, R., & Young, S. (2001). "Born-again global" firms: An extension to the "born global" phenomenon. *Journal of International Management, 7*(3), 173–189.
Bell, J., Mcnaughton, R., Young, S., & Crick, D. (2003). Towards an integrative model of small firm internationalisation. *Journal of International Entrepreneurship, 1*, 339–362.
Bembom, M., & Schwens, C. (2018). The role of networks in early internationalizing firms: A systematic review and future research agenda. *European Management Journal, 36*(6), 679–694.
Bettiol, M., Capestro, M., De Marchi, V., & Di Maria, E. (2020). *Industry 4.0 investments in manufacturing firms and internationalization. Dipartimento di Scienze Economiche" Marco Fanno*, 0245.
Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. WW Norton & Company.
Büchi, G., Cugno, M., & Castagnoli, R. (2018). Economies of scale and network economies in Industry 4.0. Symphonya. *Emerging Issues in Management*, (2), 66–76.
Büchi, G., Cugno, M., & Castagnoli, R. (2020). Smart factory performance and Industry 4.0. *Technological Forecasting and Social Change, 150*, 119790.
Buckley, P. J., Doh, J. P., & Benischke, M. H. (2017). Towards a renaissance in international business research? Big questions, grand challenges, and the future of IB scholarship. *Journal of International Business Studies, 48*(9), 1045–1064.
Bueno, A. F., Godinho Filho, M., & Frank, A. G. (2020). *Smart production planning and control in the industry 4.0 context: A systematic literature review*. Computers & Industrial Engineering, 106774.
Calof, J., & Viviers, W. (2020). Big data analytics and international market selection: An exploratory study. *Journal of Intelligence Studies in Business, 10*(2), 13–25.
Cameron, M., Viviers, W., & Steenkamp, E. (2017). Breaking the 'big data' barrier when selecting agricultural export markets: An innovative approach. *Agrekon, 56*(2), 139–157.
Canabal, A., & White, G. O., III (2008). Entry mode research: Past and future. *International Business Review, 17*(3), 267–284.
Castagnoli, R., Büchi, G., & Cugno, M. (2020). How industry 4.0 changes the value Co-creation process. In *Customer satisfaction and sustainability initiatives in the fourth industrial revolution*. IGI Global.
Castellacci, F. (2008). Technological paradigms, regimes and trajectories: Manufacturing and service industries in a new taxonomy of sectoral patterns of innovation. *Research Policy, 37*, 978–994.
Chang, Y. H., & Yeh, Y. J. Y. (2018). Industry 4.0 and the need for talent: A multiple case study of taiwan's companies. *International Journal of Product Development, 22*(4), 314–332.
Cheng, C., Zhong, H., & Cao, L. (2020). Facilitating speed of internationalization: The roles of business intelligence and organizational agility. *Journal of Business Research, 110*, 95–103.
Chiarini, A., Belvedere, V., & Grando, A. (2020). Industry 4.0 strategies and technological developments. An exploratory research from Italian manufacturing companies. *Production Planning & Control*, 1–14.
Choi, J. (2018). The rise of 3D printing and the role of user firms in the US: Evidence from patent data. *Technology Analysis & Strategic Management, 30*(10), 1195–1209.
Coe, N. M., & Yeung, H. W. C. (2015). *Global production networks: Theorizing economic development in an interconnected world*. Oxford University Press.
Coe, N. M., & Yeung, H. W. C. (2019). Global production networks: Mapping recent conceptual developments. *Journal of Economic Geography, 19*(4), 775–801.
Conseil National de l'Industrie. (2013). *Dgcis, rapport annuel du conseil national de l'industrie 2013, France*. Ivry-sur-Seine.
Coviello, N. E., & Cox, M. P. (2006). The resource dynamics of international new venture networks. *Journal of International Entrepreneurship, 4*(2–3), 113–132.
Cuervo-Cazurra, A., Mudambi, R., Pedersen, T., & Piscitello, L. (2017). Research methodology in global strategy research. *Global Strategy Journal, 7*(3), 233–240.
Dachs, B., Kinkel, S., & Jäger, A. (2019). Bringing it all back home? Backshoring of manufacturing activities and the adoption of industry 4.0 technologies. *Journal of World Business, 54*(6), 101017.
Dam, N. A. K., Le Dinh, T., & Menvielle, W. (2019). A systematic literature review of big data adoption in internationalization. *Journal of Marketing Analytics, 7*(3), 182–195.
Del Giudice, M., Scuotto, V., Garcia-Perez, A., & Petruzzelli, A. M. (2019). Shifting Wealth II in Chinese economy. The effect of the horizontal technology spillover for SMEs for international growth. *Technological Forecasting and Social Change, 145*, 307–316.
Denyer, D., & Tranfield, D. (2009). Producing a systematic review. In D. A. Buchanan, & A. Bryman (Eds.), *The Sage handbook of organizational research methods* (pp. 671–689). Sage Publications Ltd.
Dunning, J. H. (1988). The eclectic paradigm of international production: A restatement and some possible extension. *Journal of International Business Studies, 19*(1), 1–31.
Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., et al. (2020). *Setting the future of digital and social media marketing research: Perspectives and research propositions*. International Journal of Information Management, 102168.
Dzwigol, H., Dzwigol-Barosz, M., & Kwilinski, A. (2020). formation of global competitive enterprise environment based on industry 4.0 concept. *International Journal of Entrepreneurship, 24*(1), 1–5.
Eden, L. (2016). Multinationals and foreign investment policies in a digital world. *E15Initiative*. Geneva: International Centre for Trade and Sustainable Development and World Economic Forum.
Eden, L. (2018). The fourth industrial revolution: Seven lessons from the past. *International business in the information and digital age*. Emerald Publishing Limited.
Fatorachian, H., & Kazemi, H. (2021). Impact of Industry 4.0 on supply chain performance. *Production Planning & Control, 32*(1), 63–81.
Flores, E., Xu, X., & Lu, Y. (2020). *Human capital 4.0: A workforce competence typology for industry 4.0*. Journal of Manufacturing Technology Management.
Foresight, U. K. (2013). *The future of manufacturing: A new era of opportunity and challenge for the UK. Summary report*. London: The Government Office for Science.
Frank, A. G., Cortimiglia, M. N., Ribeiro, J. L. D., & de Oliveira, L. S. (2016). The effect of innovation activities on innovation outputs in the Brazilian industry: Market-orientation vs. technology-acquisition strategies. *Research Policy, 45*(3), 577–592.
Frank, H., & Hatak, I. (2014). Doing a research literature review. *How to get published in the best entrepreneurship journals*. Edward Elgar Publishing.
Gawer, A., & Cusumano, M. A. (2014). Industry platforms and ecosystem innovation. *Journal of Product Innovation Management, 31*(3), 417–433.
Gereffi, G. (2018). *Global value chains and development: Redefining the contours of 21st century capitalism*. Cambridge University Press.
Ghauri, P., Strange, R., & Cooke, F. L. (2021). *Research on international business: The new realities*. International Business Review, 101794.
Ghemawat, P. (2007). *Differences across countries: The CAGE distance framework* (pp. 8–10). Boston, USA: Harvard Business School Press. Redefining Global Strategy: Crossing Borders in a World Where Differences Still Matter.
Gómez, J., & Vargas, P. (2012). Intangible resources and technology adoption in manufacturing firms. *Research Policy, 41*(9), 1607–1619.
Götz, M. (2019). The industry 4.0 induced agility and new skills in clusters. *Foresight and STI Governance, 13*(2), 72–83.
Götz, M. (2020a). Cluster role in industry 4.0–a pilot study from Germany. *Competitiveness Review: An International Business Journal*, 1–29.
Götz, M. (2020b). Attracting foreign direct investment in the era of digitally reshaped international production. The primer on the role of the investment policy and clusters–The case of Poland. *Journal of East-West Business, 26*(2), 131–160.
Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information and Libraries Journal, 26*(2), 91–108.
Gružauskas, V., Jegelavičiūtė, R., & Navickas, M. (2017). Global logistic cluster: The future supply chain without human interference. *Social & economic revue, 15*(1).
Hannibal, M. (2020). The influence of additive manufacturing on early internationalization: Considerations into potential avenues of IE research. *Journal of International Entrepreneurship*, 1–19.
Hannibal, M., & Knight, G. (2018). Additive manufacturing and the global factory: Disruptive technologies and the location of international business. *International Business Review, 27*(6), 1116–1127.
Hao, A. W., Paul, J., Trott, S., Guo, C., & Wu, H. H. (2019). Two decades of research on nation branding: A review and future research agenda. *International Marketing Review*.
Henderson, J., Dicken, P., Hess, M., Coe, N., & Yeung, H. W. C. (2002). Global production networks and the analysis of economic development. *Review of International Political Economy, 9*(3), 436–464.
Hernes, M., Rot, A., & Jelonek, D. (Eds.). (2020). *Towards industry 4.0–current challenges in information systems (No. 887)*. Springer.
He, W., & Wang, F. K. (2015). A hybrid cloud model for cloud adoption by multinational enterprises. *Journal of Global Information Management, 23*(1), 1–23.
Hmood, K. K., & Ai-Madi, F. N. (2013). Impact of cloud computing on today's market: Facilitating the move from local to international business. *Research Journal of Business Management, 7*(1), 28–40.
Horváth, D., & Szabó, R. Z. (2019). Driving forces and barriers of Industry 4.0: Do multinational and small and medium-sized companies have equal opportunities? *Technological Forecasting and Social Change, 146*, 119–132.
Hosseini, S., Fallon, G., Weerakkody, V., & Sivarajah, U. (2019). Cloud computing utilization and mitigation of informational and marketing barriers of the SMEs from the emerging markets: Evidence from Iran and Turkey. *International Journal of Information Management, 46*, 54–69.
Hughes, L., Dwivedi, Y. K., Rana, N. P., Williams, M. D., & Raghaven, V. (2020). Perspectives on the future of manufacturing within the Industry 4.0 era. *Production planning and control*.
Jain, V., Merchant, A., Deshmukh, S., & Ganesh, B. E. (2018). May). Towards an analytical framework to understand consumer disengagement with digital advertising: An abstract. *Academy of marketing science annual conference*. Cham: Springer.
Jiang, H., Sun, S., Xu, H., Zhao, S., & Chen, Y. (2020). Enterprises' network structure and their technology standardization capability in Industry 4.0. *Systems Research and Behavioral Science, 37*(4), 749–765.
Johanson, J., & Vahlne, J. E. (1977). The internationalization process of the firm—a model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies, 8*(1), 23–32.
Johanson, J., & Vahlne, J. E. (2009). The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership. *Journal of International Business Studies, 40*(9), 1411–1431.
Jones, M. V., Coviello, N., & Tang, Y. K. (2011). International entrepreneurship research (1989-2009): A domain ontology and thematic analysis. *Journal of Business Venturing, 26*(6), 632–659.
Jovanović, M., & Đoković, N. (2016). Cloud computing as a source of competitive advantage in the global market. *Serbian Project Management Journal, 6*(2), 33–47.
Kagermann, H., Helbig, J., Hellinger, A., & Wahlster, W. (2013). *Recommendations for implementing the strategic initiative INDUSTRIE 4.0: Securing the future of German manufacturing industry. Final report of the Industrie 4.0 Working Group*. Forschungsunion.
Kagermann, H., Lukas, W., & Wahlster, W. (2011). *Industry 4.0: With the internet of things on the way to the 4th industrial revolution. 13*. VDI news.
Kaivo-Oja, J., Knudsen, M. S., & Lauraéus, T. (2018). Reimagining Finland as a manufacturing base: The nearshoring potential of Finland in an industry 4.0 perspective. *Business, Management and Education, 16*, 65–80.

Kang, H. S., Lee, J. Y., Choi, S., Kim, H., Park, J. H., Son, J. Y., et al. (2016). Smart manufacturing: Past research, present findings, and future directions. *International journal of precision engineering and manufacturing-green technology, 3*(1), 111–128.
Kano, L., Tsang, E. W., & Yeung, H. W. C. (2020). Global value chains: A review of the multi-disciplinary literature. *Journal of International Business Studies, 51*, 577–622.
Kenney, M., Rouvinen, P., & Zysman, J. (2015). The digital disruption and its societal impacts. *Journal of Industry, Competition and Trade, 15*(1), 1–4.
Khanagha, S., Ramezan Zadeh, M. T., Mihalache, O. R., & Volberda, H. W. (2018). Embracing bewilderment: Responding to technological disruption in heterogeneous market environments. *Journal of Management Studies, 55*(7), 1079–1121.
Kim, J., Abe, M., & Valente, F. (2019). Impacts of the digital economy on manufacturing in emerging asia. *Asian Journal of Innovation & Policy, 8*(1), 1–30.
Kim, D. H., & Seo, D. S. (2018). Analysis research on preparation of 4th wave (AI) of the visegrad group. *The Journal of Asian Finance, Economics and Business (JAFEB), 5*(4), 201–211.
Kim, J., Torneo, A. R., & Yang, S. B. (2019). Philippine readiness for the 4th industrial revolution: A case study. *Asia-Pacific Social Science Review, 19*(1), 139–153.
Kostin, K. B. (2018). Foresight of the global digital trends. *Strategic management, 23*(1), 11–19.
Kumar, N., & Siddharthan, N. S. (2013). *Technology, market structure and internationalization: Issues and policies for developing countries*. London: Routledge.
Laplume, A. O., Petersen, B., & Pearce, J. M. (2016). Global value chains from a 3D printing perspective. *Journal of International Business Studies, 47*(5), 595–609.
Lasi, H., Fettke, P., Kemper, H. G., Feld, T., & Hoffmann, M. (2014). Industry 4.0. *Business & information systems engineering, 6*(4), 239–242.
Liao, Y., Deschamps, F., Loures, E. D. F. R., & Ramos, L. F. P. (2017). Past, present and future of Industry 4.0-a systematic literature review and research agenda proposal. *International Journal of Production Research, 55*(12), 3609–3629.
Li, F., Frederick, S., & Gereffi, G. (2019). E-commerce and industrial upgrading in the Chinese apparel value chain. *Journal of Contemporary Asia, 49*(1), 24–53.
Li, Q., Luo, H., Xie, P. X., Feng, X. Q., & Du, R. Y. (2015). Product whole life-cycle and omni-channels data convergence oriented enterprise networks integration in a sensing environment. *Computers in Industry, 70*, 23–45.
Li, Q., Wang, Z. Y., Cao, Z. C., Du, R. Y., & Luo, H. (2015). Process and data fragmentation-oriented enterprise network integration with collaboration modelling and collaboration agents. *Enterprise Information Systems, 9*(5–6), 468–498.
Lu, Y. (2017). Industry 4.0: A survey on technologies, applications and open research issues. *Journal of industrial information integration, 6*, 1–10.
Luftman, J., Derksen, B., Dwivedi, R., Santana, M., Zadeh, H. S., & Rigoni, E. (2015). Influential IT management trends: An international study. *Journal of Information Technology, 30*(3), 293–305.
Lu, Y., Zhou, L., Bruton, G., & Li, W. (2010). Capabilities as a mediator linking resources and the international performance of entrepreneurial firms in an emerging economy. *Journal of International Business Studies, 41*(3), 419–436.
Lv, Y., & Lin, D. (2017). Design an intelligent real-time operation planning system in distributed manufacturing network. *Industrial Management & Data Systems, 117*(4), 742–753.
Majeed, A. A., & Rupasinghe, T. D. (2017). Internet of things (IoT) embedded future supply chains for industry 4.0: An assessment from an ERP-based fashion apparel and footwear industry. *International Journal of Supply Chain Management, 6*(1), 25–40.
Makris, D., Hansen, Z. N. L., & Khan, O. (2019). Adapting to supply chain 4.0: An explorative study of multinational companies. *Supply Chain Forum: International Journal, 20*(2), 116–131 (Taylor & Francis).
Manap, N. A., & Rouhani, A. (2014). Issue of transborder data flows in cloud computing the impact on economic growth. *International Business Management, 8*(2), 113–117.
Mangal, V., & Karmarkar, U. S. (2012). Global trends for technology adoption—results of the bit survey across ten countries. *The UCLA Anderson Business and Information Technologies (BIT) Project: A Global Study of Business Practice, 1*.
Marano, V., Tallman, S., & Teegen, H. J. (2020). The liability of disruption. *Global Strategy Journal, 10*(1), 174–209.
Matias, J. B., & Hernandez, A. A. (2019). Cloud computing adoption intention by MSMEs in the Philippines. *Global Business Review*, Article 0972150918818262.
Merchant, A. (2018). Big data: Ushering new vistas in market research. *Projectics/ Proyectica/Projectique, 3*, 9–12.
MISE. (2018). *La diffusione delle imprese 4.0 e le politiche: Evidenze 2017, direzione generale per la politica industriale e la competitività*. Roma: Ministero dello Sviluppo Economico.
Mohr, S., & Khan, O. (2015). 3D printing and its disruptive impacts on supply chains of the future. *Technology Innovation Management Review, 5*(11), 20.
Monaghan, S., Tippmann, E., & Coviello, N. (2020). Born digitals: Thoughts on their internationalization and a research agenda. *Journal of International Business Studies, 51*(1), 11–22.
Morais, F., & Ferreira, J. J. (2020). SME internationalisation process: Key issues and contributions, existing gaps and the future research agenda. *European Management Journal, 38*(1), 62–77.
Müller, J. M., Buliga, O., & Voigt, K. I. (2020). The role of absorptive capacity and innovation strategy in the design of industry 4.0 business Models-A comparison between SMEs and large enterprises. *European Management Journal*, 1–11.
Naglič, A., Tominc, P., & Logožar, K. (2020). The impact of industry 4.0 on export market orientation, market diversification, and export performance. *Organizacija, 53*(3), 227–244.
Nambisan, S., Zahra, S. A., & Luo, Y. (2019). Global platforms and ecosystems: Implications for international business theories. *Journal of International Business Studies, 50*(9), 1464–1486.
Neubert, M. (2018). The impact of digitalization on the speed of internationalization of lean global startups. *Technology Innovation Management Review, 8*(5), 44–54.
Oviatt, B. M., & McDougall, P. P. (2005). Toward a theory of international new ventures. *Journal of International Business Studies, 36*(1), 29–41.
Özemre, M., & Kabadurmus, O. (2020). A big data analytics based methodology for strategic decision making. *Journal of Enterprise Information Management*.
Palmatier, R. W., Houston, M. B., & Hulland, J. (2018). Review articles: Purpose, process, and structure. *Journal of the Academy of Marketing Science, 46*, 1–5.
Papadopoulos, N., & Heslop, L. A. (2014). *Product-country images: Impact and role in international marketing*. New York: Routledge.
Paul, J., & Criado, A. R. (2020). The art of writing literature review: What do we know and what do we need to know? *International Business Review, 9*(4), 101717.
Paul, J., Merchant, A., Dwivedi, Y. K., & Rose, G. (2021). Writing an impactful review article: What do we know and what do we need to know? *Journal of Business Research, 133*, 337–340.
Paul, J., & Rosado-Serrano, A. (2019). Gradual internationalization vs born-global/ international new venture models. *International Marketing Review, 36*(6), 830–858.
Peterson, M. F., Arregle, J. L., & Martin, X. (2012). Multilevel models in international business research. *Journal of International Business Studies, 43*(5), 451–457.
Popkova, E. G., Ragulina, Y. V., & Bogoviz, A. V. (Eds.). (2019). *Industry 4.0: Industrial revolution of the 21st century* (p. 253). Springer.
Porter, M. E., & Heppelmann, J. E. (2014). How smart, connected products are transforming competition. *Harvard Business Review, 92*(11), 64–88.
Rafael, R., Shirley, A. J., & Liveris, A. (2014). *Report to the president accelerating US advanced manufacturing*. US: Report.
Raj, A., Dwivedi, G., Sharma, A., de Sousa Jabbour, A. B. L., & Rajak, S. (2020). Barriers to the adoption of industry 4.0 technologies in the manufacturing sector: An inter-country comparative perspective. *International Journal of Production Economics, 224*, 107546.
Raymond, L., Bergeron, F., Croteau, A. M., & St-Pierre, J. (2015). Developing absorptive capacity through e-business: The case of international SMEs. *Journal of Small Business Management, 53*(sup1), 75–94.
Rehnberg, M., & Ponte, S. (2016). *3D Printing and Global Value Chains: How a new technology may restructure global production*. Singapore: Global Production Networks Centre.
Reischauer, G. (2018). Industry 4.0 as policy-driven discourse to institutionalize innovation systems in manufacturing. *Technological Forecasting and Social Change, 132*, 26–33.
Rose, G. M. (2015). *Innovation and information technology*. Wiley Encyclopedia of Management.
Rostow, W. W. (1988). *The fourth industrial revolution and American society: Some reflections on the past for the future. Cooperation and competition in the global economy*. Cambridge, Mass: Balling Publishing Co.
Rüßmann, M., Lorenz, M., Gerbert, P., Waldner, M., Justus, J., Engel, P., et al. (2015). Industry 4.0: The future of productivity and growth in manufacturing industries. *Boston Consulting Group, 9*(1), 54–89.
Samiee, S. (2020). International marketing and the internet: A research overview and the path forward. *International Marketing Review*.
Schmidt, M. C., Veile, J. W., Müller, J. M., & Voigt, K. I. (2020). Ecosystems 4.0: Redesigning global value chains. *International Journal of Logistics Management*.
Schneider, M. (2018). Digitalization of production, human capital, and organizational capital. In C. Harteis (Ed.), *The impact of digitalization in the workplace. Professional and practice-based learning* (Vol. 21). Cham: Springer.
Schwab, K. (2016). The fourth industrial revolution. *Davos*, 2016.
Schwab, K. (2017). The fourth industrial revolution. *Currency*.
Sinkovics, R. R., & Sinkovics, N. (2020). The Internet and international marketing–from trigger technology to platforms and new markets. *International Marketing Review*.
Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333–339.
Sousa, M. J. (2018). The impact of the internet of things on global trade: A multiple-case study on multinationals. *Transnational Corporations Review, 10*(2), 108–114.
Stentoft, J., Wickstrøm, K. A., Haug, A., & Philipsen, K. (2020). Cost-driven motives to relocate manufacturing abroad among small-and medium-sized manufacturers. *Journal of Manufacturing Technology Management*, 1–21.
Strange, R., & Zucchella, A. (2017). Industry 4.0, global value chains and international business. *Multinational Business Review*.
Szalavetz, A. (2019a). Industry 4.0 and capability development in manufacturing subsidiaries. *Technological Forecasting and Social Change, 145*, 384–395.
Szalavetz, A. (2019b). Digitalisation, automation and upgrading in global value chains–factory economy actors versus lead companies. *Post-communist Economies, 31* (5), 646–670.
Szász, L., Demeter, K., Rácz, B. G., & Losonci, D. (2020). Industry 4.0: A review and analysis of contingency and performance effects. *Journal of Manufacturing Technology Management*, 1–28.
Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management, 14*(3), 207–222.
Ustundag, A., & Cevikcan, E. (2017). *Industry 4.0: Managing the digital transformation*. Springer.
Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., et al. (2019). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research, 122*, 889–901.
Vieira, E., & Gomes, J. (2009). A comparison of Scopus and Web of Science for a typical university. *Scientometrics, 81*(2), 587–600.
Vlacic, B., González-Loureiro, M., & Eduardsen, J. (2019). The internationalization of SMEs: Strategic choices under a cognitive approach. *Handbook of research on entrepreneurship, innovation, and internationalization*. IGI global.

Vlačić, B., González-Loureiro, M., & Eduardsen, J. (2020). *The process of the process of internationalisation: Cognitive and behavioural perspectives in small ventures*.
Vrontis, D., & Christofi, M. (2019). R&D internationalization and innovation: A systematic review, integrative framework and future research directions. *Journal of Business Research*.
Weerawardena, J., Mort, G. S., Liesch, P. W., & Knight, G. (2007). Conceptualizing accelerated internationalization in the born global firm: A dynamic capabilities perspective. *Journal of World Business, 42*(3), 294–306.
Williams, R. I., Clark, L. A., Clark, W. R., & Raffo, D. M. (2020). Re-examining systematic literature review in management research: Additional benefits and execution protocols. *European Management Journal*.
Wübbeke, J., Meissner, M., Zenglein, M. J., Ives, J., & Conrad, B. (2016). Made in China 2025. Mercator institute for China studies. *Papers on China, 2*, 74.
Yeung, H. W. C. (2009). Regional development and the competitive dynamics of global production networks: An east asian perspective. *Regional Studies, 43*(3), 325–351.
Yeung, H. W. C. (2018). *The logic of production networks* (pp. 382–406). Oxford: Oxford University Press.
Yip, G. S. (1994). Industry drivers of global strategy and organization. *International Executive, 36*(5), 529–556.