Industrial Marketing Management 114 (2023) 297–312

Contents lists available at ScienceDirect

Industrial Marketing Management

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

Value capture in open innovation: A literature review and a research agenda

Adrian Toroslu [a,b,*], Brita Schemmann [b], Maryse M.H. Chappin [c], Carolina Castaldi [a], Andrea M. Herrmann [d]

[a] Department of Human Geography and Spatial Planning, Utrecht University, Utrecht, the Netherlands
[b] School of International Business, Hochschule Bremen, Bremen, Germany
[c] Copernicus Institute of Sustainable Development, Utrecht University, Utrecht, the Netherlands
[d] Nijmegen School of Management, Radboud University, Nijmegen, the Netherlands

ARTICLE INFO

Keywords:
Open innovation
Value capture
Value appropriation
Integrative literature review
Research agenda

ABSTRACT

While empirical research on open innovation initially focused on value creation, there has been a growing interest in value capture among academics and companies. Understanding value capture is crucial, as the success of open innovation activities depends on the value capture potential of all actors involved. To provide an overview of the key findings and guide future research, we conducted an integrative literature review of 69 empirical studies on value capture in open innovation. When analyzing these studies, we focused on what value is captured, who captures it, and how actor strategies influence the value captured in collaborative innovation activities. Our analysis identified four areas for further research, namely (i) broadening concepts and measures of value, (ii) understanding the importance of contextual factors in capturing value, (iii) adopting a dynamic perspective in studying value capture, and (iv) capturing social and environmental value in light of wicked problems.

1. Introduction

Open innovation strategies have gained popularity, in part, due to advancements in digitalization, which have facilitated new and diverse forms of collaboration between organizations and online communities (Bogers et al., 2017; Huang & Rust, 2017). As a result, research on open innovation has grown significantly over the past decade (Bogers, Chesbrough, & Moedas, 2018; Dahlander, Gann, & Wallin, 2021). Coined by Henry Chesbrough (2003), the term open innovation (OI) refers to a 'distributed innovation process based on purposively managed knowledge flows across organizational boundaries' (Chesbrough & Bogers, 2014, p. 5).

Since the early 2000s, researchers have emphasized the importance of studying both value creation and value capture in OI (Chesbrough, 2003; Chesbrough & Rosenbloom, 2002). However, initial empirical work in this field primarily focused on value creation (West & Bogers, 2014). In recent years, there has been a growing awareness among academics and companies alike of the need to also examine value capture in OI. This is not surprising, given that the long-term success of most OI activities ultimately depends on the ability of the actors involved to capture value. If actors are not satisfied with the value they capture, the success of OI activities is at risk. Research has shown that actors only continue to collaborate if they receive some form of compensation for their value creation efforts (Chesbrough, Lettl, & Ritter, 2018; Franke, Keinz, & Klausberger, 2013). An example that illustrates how much value capture matters in OI is the one discussed by Granstrand and Holgersson (2014). Their case study concerns an innovation collaboration between a large European multinational corporation and a small US R&D firm. The OI project had a troublesome termination, with intellectual property disputes leading to serious tensions between partners. The case study shows that such tensions could have been avoided if the OI partners had made contractual arrangements that considered all types of values created and which part each partner would be able to capture. This demonstrates that to prevent OI collaboration failures, it is necessary to understand what is at stake, who of the collaborating partners receives which share, and how value capture is secured. It highlights the need to fully understand value capture processes in OI. A lack of understanding can jeopardize the outcome of the OI process and

* Corresponding author at: Economic Geography, Human Geography and Spatial Planning, Utrecht University, Princetonlaan 8a, 3584 CB Utrecht, the Netherlands.
E-mail address: a.k.toroslu@uu.nl (A. Toroslu).

https://doi.org/10.1016/j.indmarman.2023.08.012
Received 6 December 2022; Received in revised form 5 August 2023; Accepted 19 August 2023
Available online 15 September 2023
0019-8501/© 2023 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

even lead to long-lasting tensions in partner relationships.

Beyond the above example, there is a more general acknowledgement that companies might focus on the value created through OI, but underestimate or disregard the challenges of how to actually capture value from it (Stefan, Hurmelinna-Laukkanen, Vanhaverbeke, & Oikarinen, 2022). Additional evidence supporting this issue comes from research on crowdsourcing. Firms are able to crowdsource innovative ideas, but only implement one out of 500 ideas proposed by the community (Hossain & Islam, 2015). Moreover, crowdsourcing exposes firms to knowledge leakages, therefore strategies to mitigate this exposure while still being able to capture value from the crowdsourced ideas are a key concern of crowdsourcing platforms (de Jong et al., 2016; Lakhani & Lonstein, 2008).

While studies addressing OI have increasingly investigated challenges related to value capture, our understanding of the factors that facilitate or hinder value capture is still fragmented and therefore limited as empirical insights gained on this matter have not yet been brought together by an integrative literature review.[1] Specifically, there is a large body of research demonstrating the potential benefits of OI in general (Barge-Gil, 2013; Ebersberger, Bloch, Herstad, & Van De Velde, 2012; Laursen & Salter, 2006; Vahter, Love, & Roper, 2014), yet evidence-based insights are often scattered and lack integration. There could be two reasons for this. First, OI can involve a diverse range of actors, including individuals, firms, or communities who may or may not know each other beforehand. Therefore, interests in value capture, along with the factors influencing the value capture process, could depend on the actors involved. Second, the definition and conceptualization of the term 'value' can differ significantly among researchers, making it difficult to compare and to integrate insights. Consequently, the significance of various factors may vary depending on the specific definition employed in the analysis. Given the importance of value capture in OI and the fragmented nature of the research field, it is time to consolidate key empirical insights to guide future scholarly work.

To address this gap, we conducted an integrative literature review of studies on value capture in OI. Our review has two objectives: first, to analyze and synthesize existing empirical evidence, providing a comprehensive understanding of the current state of knowledge on value capture in OI; and second, to identify potential avenues for future empirical research in this area. To achieve our objectives, our literature review is structured around three guiding questions. While these guiding questions are not used as selection criteria, they provide a useful framework for organizing our analysis of the literature. First, because the term 'value' encompasses a broad range of indicators and measures, we answer the call for a new narrative on value capture by examining value beyond its economic definition (Piller et al., 2020). We therefore ask *what* value is captured and how it is defined in OI activities. Second, given that OI activities involve knowledge and resource exchanges between a focal actor and different types of external actors (Bogers et al., 2017), it is essential to identify which actors aim to capture value in OI. Hence, we ask *who* captures value from OI activities. This question is crucial for understanding the distribution of value among actors. Third, we focus on the process of value capture, as it is critical to understand how OI collaborations generate value for the actors involved. Thus, we ask *how* value is captured. In other words, what mechanisms and factors contribute to or hinder value capture in OI. This question is essential for identifying the specific actions and strategies that can help actors involved in OI activities to capture value successfully. By focusing on these three questions, we contribute to current OI community discourse (Dahlander et al., 2021; Majchrzak, Bogers, Chesbrough, & Holgersson, 2023; Piller et al., 2020) and provide researchers with relevant background knowledge to guide future investigations into value capture in OI. In contrast to research that focuses on the impact of OI on firm or innovation performance (see e.g., Ebersberger, Galia, Laursen, & Salter, 2021; Laursen & Salter, 2006), we zoom in on the specific mechanisms, factors, and processes that facilitate value capture in OI.

2. Value capture in open innovation

Teece (1986) was one of the first scholars to systematically study how firms profit from their own innovations. By linking the fields of strategy and innovation, Teece addressed the question of why innovative firms often fail to realize the economic rents from their innovations. To optimally capture the profits from an innovation, firms must decide whether to allocate a portion of innovation activities to owners of complementary assets or to integrate all required complementary assets. This decision depends on the interplay between the strength of the appropriability regime and the control over complementary and specialized assets. While the appropriability regime was viewed as exogenous given in its earliest conceptualization, Pisano and Teece (2007) broadened this view by considering how a firm can actively shape its appropriability regime. They also integrated aspects of open innovation, arguing that collaborative innovation activities are facilitated in contexts with clear intellectual property rights or control over key complementary assets.

Recognizing the importance of capturing returns from innovation, OI scholars addressed the aspect of value capture early on. While early work provided a rather general framework on value capture in OI (Chesbrough, 2003), later research elaborated on this concept in greater detail (Chesbrough et al., 2018). Subsequent research by OI scholars often investigated the "paradox of openness," which describes the tension between sharing knowledge through collaboration with other organizations and protecting one's own technological know-how (Arora, Athreye, & Huang, 2016; Bogers, 2011; Laursen & Salter, 2014; Wadhwa, Bodas Freitas, & Sarkar, 2017). The tension between knowledge sharing and appropriability in open innovation collaborations reflects the need for collaborative value creation and simultaneous value capture by the innovating firm (Chesbrough et al., 2018). These developments underscore the critical role of capitalizing on externally sourced resources and knowledge in OI.

The definition of value in OI has evolved over time from a purely economic concept to a more nuanced definition that considers a broader range of indicators and measures of value. Early scholars studying the value capture of innovations, were largely referring to economic value as they investigated who captures the economic returns of innovations (Pisano, 2006; Pisano & Teece, 2007; Teece, 1986). In the OI field, this has developed into a broader definition of value capture, which is considered "as the process of securing financial or nonfinancial return[s] from value creation" (Chesbrough et al., 2018, p. 933). It was further distinguished between value partaking and value negotiation (Chesbrough et al., 2018). While the former is defined as value capture through partaking in, and profiting from, other actors' value creation, the latter is defined as profiting from access to and ownership of firm resources. Our integrative literature review examines both financial and non-financial values in the context of value capture in OI, in line with the broader definition of value that recognizes the importance of considering a range of outcomes beyond just financial returns. In line with the definition of Chesbrough et al. (2018), we focus on organizational processes and factors that ensure the capture of financial and non-financial rewards through engaging in OI.

[1] The literature review by Niesten and Stefan (2019) examines research on value capture in collaborative innovation activities. The authors focus on factors that promote and resolve paradoxical tensions between co-creating and capturing value in interorganizational relationships, adopting the theoretical perspective of paradox theory (Smith & Lewis, 2011). This focus might exclude mechanisms and practices of value capture unrelated to paradoxical tensions. Moreover, it overlooks articles that exclusively investigate the value capture aspect of OI.

3. Methodology

We conducted an integrative literature review to analyze and synthesize the empirical evidence gained on value capture in OI so far and highlight necessary avenues for future research (Torraco, 2005, 2016). This approach involves two key steps, namely: 1) deconstructing the topic into its fundamental elements to extract the key relationships between the different constructs; and 2) integrating these insights with new ideas to propose novel perspectives on the topic. To identify and select relevant articles for our review, we employed standard practices commonly used in the field, including searching and screening (Niesten & Stefan, 2019; Tranfield, Denyer, & Smart, 2003; Watson, Wilson, Smart, & Macdonald, 2018). We selected Scopus as the primary database for our study due to its wide-ranging coverage of diverse disciplines and journals (Mongeon & Paul-Hus, 2016). However, even the use of Scopus as the bibliographic database could potentially introduce bias in favor of research from countries that tend to publish in English language journals (Mongeon & Paul-Hus, 2016). Despite this potential bias, we consider Scopus to be the most appropriate choice because we do not anticipate significant differences among countries in terms of researchers studying value capture in OI.

3.1. Searching

We identified and selected relevant keywords and keyword combinations through a literature scoping process. The keyword groups and combinations that we used to conduct the literature search are presented in Table 1. The first keyword group comprised various terms that are commonly used to describe OI in the literature. We also included other collaborative innovation related terms frequently used in the field, such as 'crowdsourcing,' 'open source,' 'coopetition,' and 'R&D collaboration,' to identify studies that explore the same phenomenon but do not use the keyword 'open innovation.' We exclusively used keywords that signify a type of collaboration between agent(s). For example, we did not include keywords such as 'acquiring,' 'selling,' 'sourcing,' or 'revealing' which Dahlander and Gann (2010) identified as distinct forms of openness. Such keywords describe firm strategies that are not exclusive to the field of OI. We presume that if researchers investigate specific firm strategies within the context of collaborative innovation, they embed their research into the broader field of OI by using one of the keywords we have selected.

Table 1
Keyword groups.

	Group I – OI keywords	*Group II – keywords relating to value capture or lack thereof*
Keywords	"open innovat*" "distributed innovat*" "external innovat*" co-creat* innovat* cocreat* innovat* crowdsourcing innovat* "user innovat*" coopetit* innovat* co-opetit* innovat* "open source" innovat* "R&D collaborat*" cooperat* innovat* "innovat* partnership*" "supplier collaborat*" innovat* "customer collaborat*" innovat* "university collaborat*" innovat* "university industry collaborat*" innovat* "B2B collaborat*" innovat* "joint venture" innovat* "interfirm innovat*" "interorgani?ation* innovat*" hackathon innovat* co-innovat* "R&D alliance*"	"value captur*" "captur* value" "value appropriat*" "appropriat* value" misappropriat* "value co-destruct*" "co-destruct* of value" "knowledge spillover*" "knowledge leakage*"

Note: The operator "" signifies exact keyword matching. The operator * searches for words with the same root, for instance 'R&D collaboration' or 'R&D collaborators'. The operator ? is a placeholder for any letter instead of ?, for example, 'interorganizational' or 'interorganisational.'

The second group of keywords pertained to the concept of value capture, or the absence of it. Some of these terms originated from the strategy and marketing literature (Bowman & Ambrosini, 2000; Jacobides, Knudsen, & Augier, 2006; Lepak, Smith, & Taylor, 2007), but have been adapted and popularized by leading OI scholars (Chesbrough et al., 2018; Laursen & Salter, 2014). We selected these keywords to identify studies that examined how value is either gained or lost in OI. We excluded more general terms, such as 'profit,' because they are often used more broadly and do not specifically relate to how firms capture value from collaborative innovation activities.

We searched the literature by combining the search terms from the first and the second keyword groups using the 'AND' operator. The search was restricted to article titles, keywords, and abstracts, and limited to articles published in English. Our search was performed on June 20, 2022, and yielded an initial set of 315 articles published between 1970[2] and 2022.

3.2. Screening

As a basic criterion for article inclusion, it is important to highlight that the definition of OI emphasizes 'purposively managed knowledge flows' among innovation collaboration partners (Chesbrough, 2003; Chesbrough et al., 2018; Dahlander & Gann, 2010; West & Bogers, 2014). Therefore, we have chosen to focus our analysis on articles that investigate how actors manage value capture in OI. By adopting this perspective, we aim to highlight the significance of actor capabilities and practices in facilitating and managing collaborative innovation activities. This approach allows us to delve deeper into the understanding of how different actors purposively engage in OI with the intention of capturing value. Consequently, articles that focused on knowledge creation in self-organizing networks (Dutton, 2008) or did not examine an actor's efforts to manage OI activities (Dedrick & Kraemer, 2015) were excluded from our analysis. Additionally, our goal is to synthesize the current state of original research findings to develop a research agenda for future empirical work on value capture in OI. Therefore, we solely reviewed articles that engaged in empirical investigations. There is also conceptual (e.g., Chesbrough et al., 2018) and mathematical modeling research (e.g., Wang & Li, 2021) that hypothesizes about value capture in OI. These conceptual and modeling studies do not investigate to what extent hypothesized relations and effects are also observed in empirical settings. Therefore, those studies are not included, and our review exclusively examines research that investigates processes and factors that impact value capture, supported by empirical data. Furthermore, we excluded articles that examined the relationship between mechanisms of value capture and the willingness to engage in OI. For instance, studies such as Miozzo, Desyllas, Lee, and Miles's (2016) investigation of the influence of formal, contractual, or strategic value capture mechanisms on the significance or extent of innovation collaboration with external partners were excluded from our review. Moreover, studies that examine prior value capture from innovations as a precursor to new R&D collaborations were not considered in our review as they do not investigate actual value capture resulting from OI, but rather focus on

[2] Our search yielded ten articles published prior to Chesbrough's seminal work (2003), which first introduced and elaborated on the concept of open innovation.

the influence of previous experiences on the likelihood of engaging in OI (e.g., Belderbos, Gilsing, Lokshin, Carree, & Sastre, 2018).

We performed three rounds of exclusions. In the first round, we scrutinized titles, keywords, and abstracts to ensure that the article studied the context of innovation with external actors in an empirical setting. As a result, we excluded 176 articles. In the second round, after thoroughly examining the abstracts of the remaining articles, we then screened each article to exclusively include studies which focused on aspects of value capture in OI. This resulted in the exclusion of an additional 61 articles. The final selection was based on a comprehensive reading of each remaining article to confirm that they substantially addressed and offered valuable insights into aspects of value capture in OI. Following this step, we excluded nine more articles, which resulted in the final sample of 69 articles. Fig. 1 illustrates the literature selection process, including a schematic depiction of the main reasons for excluding articles in each of the three rounds.

To mitigate the risk of subjective influence in our article selection process, we utilized triangulation by involving two academically trained individuals. Both individuals received the same briefing on open innovation and value capture and were provided with the article selection criteria used in our screening process. We then randomly selected ten articles from the 139 publications screened in the second round of exclusions and provided them to the two academically trained individuals. They were instructed to apply the inclusion criteria and determine whether each article should be included in the literature review. In nine out of 10 cases, their selection of articles matched our own. The one discrepancy was due to a misunderstanding of the selection criteria, indicating the robustness of our article selection process.

3.3. Extraction and synthesis

Our analytical strategy consisted of two steps. First, we followed Torraco's suggestions for writing integrative literature reviews (Torraco, 2005, 2016), which emphasize the importance of conducting a critical analysis that can lead to the identification of new research areas. To recap, our goal is to review the existing work on value capture in OI with a focus on *what* value is captured, *who* captures it, and *how* is it captured. To achieve this objective, we first listed the research context for each article, as well as the data source, unit of analysis, definition of value, and key findings on value capture. This enabled us to break down each article into its fundamental components and identify key relationships between different constructs. For instance, we could identify whether particular value capture factors were only examined in certain types of OI collaborations. Moreover, by specifying the unit of analysis and the definition of value, we were able to address our initial questions of what value is captured and who captures it. By deconstructing each article in this manner, we gained a comprehensive understanding of the different value capture mechanisms and factors in OI, which allowed us to address our last research objective of proposing new perspectives on the topic.

The subsequent coding process then enabled us to answer our three questions separately. To determine the *type of value* being captured, we coded the different definitions or measurements of value used in the articles. For quantitative studies, we examined the operationalization of value in the methods section. For qualitative studies, we first looked for a definition or operationalization of value, and if it was missing, we assessed the different value outcomes mentioned in the results section. To determine *who captured value*, we analyzed and coded the different actors (e.g., individual, organization, network, environment) mentioned in the articles in relation to capturing value. If a mix of actors was involved, the results of value capture were noted with reference to the corresponding actors. To answer *how value is captured*, we examined the results and discussion sections to identify the mechanisms and factors underlying the processes of value capture. This analytical step was facilitated by listing all the mechanisms and factors of value capture that were prominent in each article. Examples include formal intellectual property tools, communication practices, and internal processes such as a firm's continual re-evaluation of value capture potential. After compiling this list, we grouped mechanisms or factors that addressed the same topic into separate themes.

Second, and based on this critical analysis, we synthesized the main literature topics and gaps to formulate a research agenda for future scholars seeking to advance the study of value capture in OI.

4. Findings

4.1. Descriptive analysis

Value capture in OI has been studied across various types of innovation collaborations with the most commonly studied collaborations are those using a composite measure of openness, which includes collaborations between for-profit firms and private-public collaborations (32%). Another common research context is to focus solely on collaborations between private firms (29%). In contrast, multi-actor networks (12%), collaborations between a private and a public organization (9%), collaborations between an organization and a group of potential solvers (7%), or firm-community collaborations (7%) are less studied.

The original understanding of OI focused on firms engaging with external actors already known to them (Chesbrough, 2003). Digitalization enabled and facilitated firms to also make use of previously unknown external actors (Huang & Rust, 2017; Mele & Russo-Spena, 2015). However, the majority of research (84% of selected articles) focuses on OI with known agent(s), or relationships where the collaborating actor is known beforehand. This is interesting because research on value capture in OI—with both known and unknown agent(s)—began around the same time (approximately 2010), yet only recently there has been a surge of research on OI with unknown agent(s), especially in the context of crowdsourcing (Cricelli, Grimaldi, & Vermicelli, 2022). One potential reason for this difference is the complexity of OI with unknown agent(s), which can make it more challenging to define and understand the external actors and collect data on them.

In terms of methodological approaches used, about 70% of the reviewed articles employed a quantitative research design, while the remaining 30% use a qualitative design (mostly in the form of single or multiple case studies). Only one article used a mixed-methods research approach. Among quantitative studies, about 40% employed a cross-sectional research design, while the remaining 60% utilized either a cross-sectional design with a lagged dependent variable or a panel research design.

We observe a significant growth in publications on value capture in OI after 2016, which may be attributed to the increasing attention and interest in this topic among prominent OI scholars (Bogers & West, 2012; West & Bogers, 2014). Furthermore, our analysis indicates that research on value capture in OI is dispersed across a wide range of academic journals. While Research Policy published the most articles—just six in total—the remaining articles were distributed across 40 different journals related to business, management, and innovation.

4.2. Value definition and measurement in open innovation

Overall, researchers use a wide range of value indicators, which can be roughly divided into financial and non-financial. Table 2 presents all value measures and the articles in which they were studied. Measures of financial value commonly used by researchers include sales in general or the percentage of sales attributable to new products and services (e.g., Bien, Ben, & Wang, 2014; Bouncken, Fredrich, & Kraus, 2020), revenue/profits or the percentage of revenue/profits attributable to new products and services (e.g., Hani & Dagnino, 2020; Pedersen, Bogers, & Clausen, 2022), revenue generated by solvers in crowdsourcing competitions (e.g., Kohler, 2015; Zhang et al., 2020), as well as Tobin's q or related measures of firm market value (e.g., Belderbos, Cassiman, Faems, Leten, & Van Looy, 2014; Lv, Zeng, & Lan, 2018).

Regarding non-financial value, five measures stand out. First,

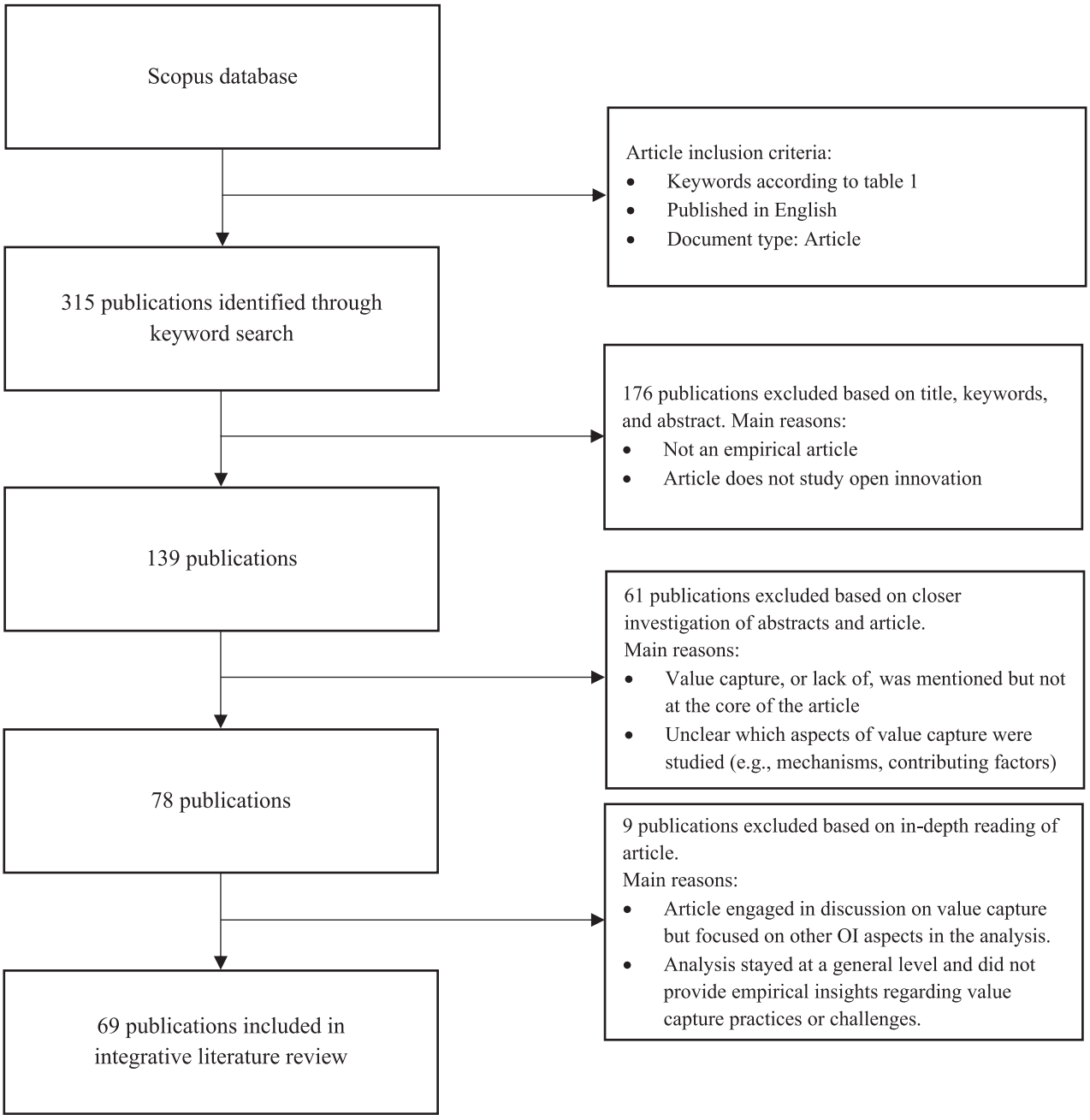

Fig. 1. Schematic illustration of the literature selection process.

researchers largely refer to the introduction of new or improved products, services, or processes (e.g., Radziwon, Bogers, & Bilberg, 2017; Stefan & Bengtsson, 2017). Second, intellectual value is often used which represents market, marketing, managerial, or technological insights (e.g., Morgan & Finnegan, 2014; Reypens, Lievens, & Blazevic, 2016). This type of value refers, for example, to a better understanding of market dynamics or insights into new management techniques. Third, some researchers use patents granted, filed, or cited as an outcome of collaborative innovation activities (e.g., Murgia, 2021; Runge, Schwens, & Schulz, 2022). Fourth, researchers also use the subjective quality of the innovative outcomes as an indicator of value capture (e.g., Seo & Park, 2022; Williams & Vossen, 2014). Finally, researchers use the measure of obtaining new partnerships or customers as an outcome of OI activities (e.g., Radziwon et al., 2017; Takahashi & Takahashi, 2022). Less frequently used measures of non-financial value indicators include firm reputation, the allocation of value capture rights,[3] environmental value, and imitation of inventions, products, or designs or IP infringement.

[3] Ozmel et al. (2017) were the first to introduce the term 'value capture rights' in our selection of articles. Value capture rights encompass various control rights over the innovation outcome, including ownership of patents and unpatented intellectual property, the right to sublicense the IP, product development and manufacturing rights, and marketing rights.

Table 2
Common financial and non-financial measurements of 'value.'

Financial value	Studies	Non-financial value	Studies
Sales	Bien et al. (2014)*, Bouncken, Fredrich, and Kraus (2020), Chen, Zeng, Yu, and Xue (2019), Dell'Era et al. (2020), Demil and Lecocq (2014)*, Díez-Vial and Fernández-Olmos (2015), Erickson (2018)*, Garcia Martinez, Zouaghi, and Sanchez Garcia (2017), Grimaldi, Greco, and Cricelli (2021), Guerrero, Heijs, and Huergo (2022), Ko, Chung, and Seo (2020), Sarpong and Teirlinck (2018), Shaikh and Levina (2019)*, Wu, Lin, and Chen (2013), Zhang, Li, and Zheng (2017), Zhang, Jiang, Wu, and Li (2019)	New or improved products/ services / processes	Arant, Fornahl, Grashof, Hesse, and Söllner (2019), Bien et al. (2014)*, Chanal and Caron-Fasan (2010)*, Chen, Yao, Zan, and Carayannis (2021), Fernandes and Ferreira (2013), Fitjar and Rodríguez-Pose (2020), Garcia, Wigger, and Hermann (2019), Heidemann Lassen, Ljungberg, and McKelvey (2020), Jirjahn and Kraft (2011), Kim, Cho, and Ramesh (2019), Montoro-Sánchez, Ortiz-de-Urbina-Criado, and Mora-Valentín (2011), Radziwon et al. (2017), Reypens et al. (2016), Simonen and McCann (2008), Stefan and Bengtsson (2017), Tojeiro-Rivero and Moreno (2019), Triguero and Fernández (2018)
Revenue / profits	Bernal, Carree, and Lokshin (2022), Chanal and Caron-Fasan (2010)*, Dell'Era et al. (2020), Demil and Lecocq (2014)*, Hani and Dagnino (2020)*, Morgan and Finnegan (2014)*, Kohler (2015)*, Kohler and Nickel (2017)*, Ko et al. (2020), Leten, Vanhaverbeke, Roijakkers, Clerix, and Van Helleputte (2013)*, Pedersen et al. (2022)*, Shaikh and Levina (2019)*, Wadhwa et al. (2017), Zhang et al. (2020)*	Intellectual value (technological, marketing, or market knowledge)	Ahlfänger, Gemünden, and Leker (2022), Basterretxea, Charterina, and Landeta (2019)*, Bien et al. (2014)*, Elia, Messeni Petruzzelli, and Urbinati (2020), Erickson (2018)*, Garcia et al. (2019), Kim et al. (2019), Leten et al. (2013)*, Morgan and Finnegan (2014)*, Napp and Minshall (2011), Pedersen et al. (2022)*, Reypens et al. (2016), Shaikh and Levina (2019)*, Takahashi and Takahashi (2022)
Market value / share	Belderbos et al. (2014), Bien et al. (2014)*, Dell'Era et al. (2020), Demil and Lecocq (2014)*, de Oliveira, Verreynne, Steen, and Indulska (2021), Lv et al. (2018), Williams and Vossen (2014)*	Patents granted / filed /cited	Arora et al. (2016), Hani and Dagnino (2020)*, Leten et al. (2013)*, Murgia (2021), Runge et al. (2022), Shkolnykova and Kudic (2022), Yan, Dong, and Faems (2020)
Firm performance	Basterretxea et al. (2019)*, Nagle (2018), Seo and Park (2022)*, Wu et al. (2013)	Innovation quality	Ahlfänger et al. (2022), Bouncken, Fredrich, Ritala, and Kraus (2020), Seo and Park (2022)*, Wang and Jiang (2020), Williams and Vossen (2014)*, Zhang et al. (2020)*
IP infringement	Demil and Lecocq (2014)*	New partnerships / customers	Demil and Lecocq (2014)*, Elia et al. (2020), Morgan and Finnegan (2014)*, Radziwon et al. (2017), Reypens et al. (2016), Takahashi and Takahashi (2022)
		Reputation	Ahlfänger et al. (2022), Chanal and Caron-Fasan (2010)*, Kohler (2015)*, Kohler and Nickel (2017)*, Radziwon et al. (2017)
		Allocation of value capture rights	Adegbesan and Higgins (2011), Devarakonda, Reuer, and Tadikonda (2022), Hurmelinna-Laukkanen and Ritala (2010), Ozmel, Yavuz, Reuer, and Zenger (2017)
		Environmental value	Garcia et al. (2019), Li-Ying, Mothe, and Nguyen (2018), Zhang, Xu, Wang, and Zhang (2022)
		Imitation / knowledge leakage	Ahlfänger et al. (2022), Foege, Piening, and Salge (2017)

Note: The table excludes studies that solely refer to the concept of value without using any concrete measures: Foege, Lauritzen, Tietze, and Salge (2019), Garcia et al. (2019), Stefan, Hurmelinna-Laukkanen, and Vanhaverbeke (2021), Barbic, Jolink, Niesten, and Hidalgo (2021). Articles marked with an asterisk examine both financial and non-financial value indicators, sometimes using a composite measure in quantitative studies.

Overall, a slightly greater portion of research on value capture in OI has focused on non-financial value outcomes. There are two notable findings worth highlighting. First, among the 69 selected articles, 54 exclusively concentrate on either financial or non-financial outcomes, with only 15 examining both financial and non-financial outcomes together. Notably, eight of these articles explore OI contexts of crowdsourcing or firm-community collaboration, where the OI partner is unknown in advance (e.g., Kohler, 2015; Shaikh & Levina, 2019). The combined study of financial and non-financial value outcomes is more prevalent in OI contexts where the collaboration partner is not predetermined, as these articles account for the minority of the 69 selected articles. Second, value capture encompasses both financial and non-financial benefits (Chesbrough et al., 2018). We find that non-financial outcomes may either be more or less closely linked to potential financial gains. Measures such as the development of new or improved products and services, or filling or granting of patents, potentially have a more immediate impact on tangible financial benefits. On the other hand, measures such as intellectual value or new partnerships exhibit a weaker link to financial gains. Consequently, some non-financial value outcomes can be regarded as intermediate outcomes of OI activities, preceding more concrete financial outcomes such as increases in sales or revenue, which materialize at a later stage (Takahashi & Takahashi, 2022).

4.3. Who captures value in OI?

In our analysis, various actors were found to capture value from OI. Table 3 shows all actors that were found to capture value from OI. The majority of studies focus on organizations capturing financial or non-financial value from OI in different contexts, including business-to-business relationships (e.g., Lv et al., 2018; Yan et al., 2020), public-private partnerships (e.g., Dell'Era et al., 2020; Díez-Vial & Fernández-Olmos, 2015), multi-actor networks (e.g., Hurmelinna-Laukkanen & Ritala, 2010; Leten et al., 2013), firm-community collaborations (e.g., Elia et al., 2020; Morgan & Finnegan, 2014), and firm interactions with crowdsourcing solvers (Chanal & Caron-Fasan, 2010). Nevertheless, some researchers also address other types of actors capturing value from OI: Five articles focus on value capture by individuals in crowdsourcing contests or firm-community collaboration. Another five articles examine possible value spillovers effects that occur when firm-level decisions indirectly influence value capture of actors not directly involved in the OI activity. Three of these five articles examine value capture by a network when multiple firms collaborate with each other (Garcia et al., 2019; Kim et al., 2019; Reypens et al., 2016), and three examine value capture by the market or the larger natural environment (Demil & Lecocq, 2014; Garcia et al., 2019; Li-Ying et al., 2018), with Garcia et al. (2019) addressing both perspectives.

In summary, researchers on value capture in OI have predominantly focused on how firms benefit from such collaborative innovation activities. Only ten of the 69 analyzed articles investigate value capture by

Table 3
Actors that actively or passively capture value in OI activities through direct involvement or spillover effects.

Actor	Studies
Organization	Adegbesan and Higgins (2011), Ahlfänger et al. (2022), Arant et al. (2019), Arora et al. (2016), Barbic et al. (2021), Basterretxea et al. (2019), Belderbos et al. (2014), Bernal et al. (2022), Bien et al. (2014), Bouncken, Fredrich, and Kraus (2020), Bouncken, Fredrich, Ritala, and Kraus (2020), Chanal and Caron-Fasan (2010), Chen et al. (2019), Dell'Era et al. (2020), Demil and Lecocq (2014), de Oliveira et al. (2021), Devarakonda et al. (2022), Díez-Vial and Fernández-Olmos (2015), Elia et al. (2020), Erickson (2018), Fernandes and Ferreira (2013), Fitjar and Rodríguez-Pose (2020), Foege et al. (2017), Garcia et al. (2019), Garcia Martinez et al. (2017), Grimaldi et al. (2021), Guerrero et al. (2022), Hani and Dagnino (2020), Heidemann Lassen et al. (2020), Hurmelinna-Laukkanen and Ritala (2010), Jirjahn and Kraft (2011), Kim et al. (2019), Ko et al. (2020), Kohler (2015), Kohler and Nickel (2017), Leten et al. (2013), Lv et al. (2018), Li-Ying et al. (2018), Montoro-Sánchez et al. (2011), Morgan and Finnegan (2014), Murgia (2021), Nagle (2018), Napp and Minshall (2011), Ozmel et al. (2017), Pedersen et al. (2022), Radziwon et al. (2017), Reypens et al. (2016), Runge et al. (2022), Sarpong and Teirlinck (2018), Seo and Park (2022), Shaikh and Levina (2019), Shkolnykova and Kudic (2022), Simonen and McCann (2008), Stefan and Bengtsson (2017), Stefan et al. (2021), Takahashi and Takahashi (2022), Triguero and Fernández (2018), Tojeiro-Rivero and Moreno (2019), Wang and Jiang (2020), Williams and Vossen (2014), Wadhwa et al. (2017), Wu et al. (2013), Yan et al. (2020), Zhang et al. (2019), Zhang et al. (2017), Zhang et al. (2022)
Crowdsourcing or community platform users	Elia et al. (2020), Foege et al. (2019), Kohler (2015), Kohler and Nickel (2017), Zhang et al. (2020)
Network	Garcia et al. (2019) ★, Kim et al. (2019) ★, Reypens et al. (2016) ★
Natural environment	Garcia et al. (2019) ★, Li-Ying et al. (2018) ★
Market	Demil and Lecocq (2014)★

Note: Articles marked with a star (★) do not examine the active value capture practices or challenges faced by the corresponding actor. Instead, they mention the increase or decrease in value due to spillover effects.

other actors. Of these ten articles, six study OI activities where firms engage with OI partners that are unknown in advance, such as in crowdsourcing or firm-community collaboration contexts.

4.4. Value capture mechanisms and factors in OI

This section focuses on the empirical evidence of mechanisms and factors that influence value capture in OI. Based on our review of the selected articles, we identified three distinct parts that make up the process of how value is captured in OI. First, we identify formal (e.g., intellectual property rights) and informal (e.g., selective revealing) mechanisms that actors use to ensure value capture in OI. Second, researchers describe factors that either facilitate or hinder value captured in OI, such as collaboration management practices and trust. Finally, studies examine the characteristics of firms or individual solvers that influence value capture. Despite these contextual characteristics usually being fixed and cannot be changed during an ongoing OI activity, they are nevertheless important to consider at an early stage of an OI process when actors decide with whom they want to engage. Table 4 presents the most important findings of the articles with respect to the three parts that are critical for value capture. The table also provides information about the research context of each paper, including, the type of OI collaboration examined, the industry in which the studied organizations operate, and the country from which the data originates. For an overview of the various articles that address the combination of *what* and *how* value is captured in OI, please refer to Table A.1 in the appendix.

4.4.1. Formal and informal mechanisms of value capture

Concerning value capture mechanisms, firms use a wide range of formal (e.g., patents, trademarks) and informal (e.g., secrecy, lead-time advantages) mechanisms to prevent misappropriation and ensure value capture after successful collaboration (de Oliveira et al., 2021; Foege et al., 2017; Heidemann Lassen et al., 2020; Stefan et al., 2021; Stefan & Bengtsson, 2017; Wadhwa et al., 2017). This body of research generally shows that formal and informal protection mechanisms have a positive impact on firm value capture, while also reducing the risk of intellectual property infringement in collaborative innovation activities. Strategically using protection mechanisms to showcase innovation capabilities to external actors has been identified as a fruitful strategy for increasing value capture (Grimaldi et al., 2021). Furthermore, it should be noted that while protection mechanisms have been shown to have a positive impact on firm value capture, they may not necessarily address the underlying tensions that can arise between collaborating actors (Stefan et al., 2021). In the case of multi-actor collaborations, effective management of intellectual property is crucial for maximizing the value capture potential of each actor and ensuring the success of the collaboration (Leten et al., 2013). An overseeing institution can be helpful in ensuring unique value capture for each actor, consisting of a mix of collectively and individually created value.

In the case of innovation crowdsourcing, solvers employ a range of formal and informal mechanisms to alleviate tensions between sharing and protecting (Foege et al., 2019). These mechanisms include ex-ante patent solutions (i.e., patent thickening or a provisional patent application), collaboration tactics with the seeker firm (i.e., non-disclosure clauses, partial disclosure of relevant knowledge, solution black-boxing, and intermediary bypassing), or ex-post control of resources that enhance the customer value of a solution (i.e., complementary assets). Intellectual property issues can arise when knowledge is created collaboratively by the community rather than a single solver which can compromise value capture (Chanal & Caron-Fasan, 2010). Taking the perspective of the firm, deciding to make parts of their intellectual property available to the external community must be actively managed and be in line with industry culture (Demil & Lecocq, 2014). Otherwise, the industry may benefit from increased product offering and more customers, but the focal firm may not benefit directly. However, if managed properly, this situation can stimulate the creativity of external actors while the firm captures value from licensing or selling the intellectual property (Elia et al., 2020).

4.4.2. Factors facilitating or hindering value capture

Numerous studies have demonstrated factors that can either facilitate or hinder value capture. To increase the chances of success and reduce potential tensions between value creation and value capture, it is important to select the right actors and develop a clear strategy before engaging in OI (Ahlfänger et al., 2022; Basterretxea et al., 2019; Garcia et al., 2019; Napp & Minshall, 2011; Radziwon et al., 2017; Stefan et al., 2021; Williams & Vossen, 2014). The continuous anticipation of potential value creation and the evaluation of value outcomes that actors plan to seize are two other ex-ante firm level value capture processes (Reypens et al., 2016; Takahashi & Takahashi, 2022). Trust between actors plays an instrumental role in safeguarding against potential value capture tensions and increasing value capture by reducing negotiation costs, the risk of fraud, and misappropriation during the collaboration (Basterretxea et al., 2019; Bien et al., 2014; Garcia et al., 2019; Hurmelinna-Laukkanen & Ritala, 2010; Kim et al., 2019; Stefan et al., 2021). To this end, trust is built through a dynamic process of continuous interactions based on long-term collaboration, rapid and accurate

Table 4
Mechanisms, factors, and firm/solver characteristics associated with value capture.

	Research context			Value capture mechanisms		Factors facilitating/ hindering value capture							Contextual characteristics influencing value capture							
	Type of OI collaboration	Industry	Country	Formal IP mechanisms	Informal IP mechanisms	Strategy	Trust	Partner selection	Asymmetries between actors (financial, cultural, interests)	Collaboration management (e.g., standard practices, meetings)	Contractual instruments	Internal processes / changes	Partner type/ characteristics	Business / market environment	Knowledge transfer activities/ capabilities	Firm/ solver team size	Firm financing/ ownership	Location/ geography	Knowledge spillover	Collaboration experience
Jirjahn and Kraft (2011)	1	3	1												x				x	
Wu et al. (2013)	1	7	5												x					
Arora et al. (2016)	1	7	1												x					
Foege et al. (2017)	1	3	1	x									x		x			x		
Garcia Martinez et al. (2017)	1	1	1											x	x					
Stefan and Bengtsson (2017)	1	3	1	x	x															
Wadhwa et al. (2017)	1	3	1		x							x								
Zhang et al. (2017)	1	1	2											x						
Li-Ying et al. (2018)	1	3	1												x					
Sarpong and Teirlinck (2018)	1	2/3	1										x					x		
Triguero and Fernández (2018)	1	3	1										x						x	
Chen et al. (2019)	1	2/3	2											x			x			
Tojeiro-Rivero and Moreno (2019)	1	3	1											x						
Fitjar and Rodríguez-Pose (2020)	1	7	1										x					x		
Wang and Jiang (2020)	1	1	2												x				x	
de Oliveira et al. (2021)	1	3/4/6	2	x	x															
Grimaldi et al. (2021)	1	3	1	x											x					
Ahlfänger et al. (2022)	1	1/6	1/2/3			x				x	x								x	
Guerrero et al. (2022)	1	2/3	1										x	x		x			x	
Seo and Park (2022)	1	1	2												x					
Adegbesan and Higgins (2011)	2	1	5										x		x		x			
Napp and Minshall (2011)	2	7	5			x		x		x	x									
Bien et al. (2014)	2	3	2				x			x	x									
Williams and Vossen (2014)	2	7	1			x														
Ozmel et al. (2017)	2	1	3										x	x						
Lv et al. (2018)	2	1	2													x	x			
Zhang et al. (2019)	2	7	2											x	x		x			
Bouncken, Fredrich and Kraus (2020)	2	2/3	1			x							x			x				x
Bouncken, Fredrich, Ritala, et al. (2020)	2	1	5										x							
Hani and Dagnino (2020)	2	7	5										x							
Ko et al. (2020)	2	3	2										x		x					
Stefan et al. (2021)	2	7	1/3	x	x		x	x	x		x									
Yan et al. (2020)	2	2/3	5										x				x	x		
Chen et al. (2021)	2	1	2												x					
Bernal et al. (2022)	2	7	1										x						x	x
Devarakonda et al. (2022)	2	1	5										x		x		x			x
Runge et al. (2022)	2	4	3										x					x		
Shkolnykova and Kudic (2022)	2	1	1										x			x		x		
Takahashi and Takahashi (2022)	2	2	4									x								
Simonen and McCann (2008)	2/4	1	1										x							
Montoro-Sánchez et al. (2011)	2/4	2	1										x					x	x	
Belderbos et al. (2014)	2/4	7	1/2/3										x							
Heidemann Lassen et al. (2020)	2/4	7	1	x	x															
Hurmelinna-Laukkanen and Ritala (2010)	3	7	1	x	x		x			x	x									
Leten et al. (2013)	3	1	1	x																
Reypens et al. (2016)	3	4	1									x								
Radziwon et al. (2017)	3	1	1			x				x										
Basterretxea et al. (2019)	3	3	1			x	x			x										x
Garcia et al. (2019)	3	2	1			x	x		x											
Kim et al. (2019)	3	6	2				x			x		x								
Barbic et al. (2021)	3	1	1				x	x			x									
Fernandes and Ferreira (2013)	4	2	5															x		
Díez-Vial and Fernández-Olmos (2015)	4	1	1												x			x		
Arant et al. (2019)	4	1	1										x					x		
Dell'Era et al. (2020)	4	7	5									x								
Murgia (2021)	4	1	1										x							
Pedersen et al. (2022)	4	4	1						x	x										
Chanal and Caron-Fasan (2010)	5	1	1	x								x								
Kohler (2015)	5	7	5						x			x								
Kohler and Nickel (2017)	5	7	5						x			x								
Foege et al. (2019)	5	1	5	x	x															
Zhang et al. (2020)	5	2	5											x		x		x		
Zhang et al. (2022)	5	3	2										x							
Demil and Lecocq (2014)	6	2	5	x								x								
Morgan and Finnegan (2014)	6	7	1									x								
Erickson (2018)	6	5	1	x						x										
Nagle (2018)	6	6	3							x										
Shaikh and Levina (2019)	6	1	5					x				x								
Elia et al. (2020)	6	1	1	x						x										

Note: Articles are arranged according to the type of OI collaboration, using the following coding system: 1 = Combined measure of B2B or private-public collaboration, 2 = B2B collaboration, 3 = Collaboration between multiple actors, 4 = Private-public collaboration, 5 = Crowdsourcing, 6 = Firm-community collaboration; Industry coding: 1 = High-technology, 2 = Service, 3 = Manufacturing, 4 = Health care, 5 = Creative, 6 = IT, 7 = Mix. Finally, the country in which the research was conducted is coded using the following system Country coding: 1 = Europe, 2 = East-Asia, 3 = US, 4 = South America, 5 = unknown.

communication, and timely access to relevant data and current project status (Basterretxea et al., 2019; Kim et al., 2019). Other trust-building measures include direct interactions between actors supported by three cooperation practices: (1) Joint development agreements and project-level collaboration; (2) maintenance of clear and continuous communication channels facilitated by regular meetings; and (3) incentives for employees to collaborate with outside actors (Napp & Minshall, 2011).

Value capture is further driven by the development or improvement of internal assets, such as organizational or technological assets (Dell'Era et al., 2020; Kim et al., 2019) and by transferring the created value into the organization (Reypens et al., 2016; Takahashi & Takahashi, 2022). It is important that all collaboration partners are committed to the innovation activity to unlock its full potential (Garcia et al., 2019; Radziwon et al., 2017). In this context, commitment and motivation are enhanced when all participating actors have the potential for individual value capture. If one actor captures substantially more value than the others, it can create an imbalance in individual value capture and affect the willingness of firms to co-create and bear innovation costs. This, in turn, can ultimately impact the project outcome and increase the likelihood of collaboration failure (Barbic et al., 2021; Pedersen et al., 2022). As a means of last resort, actors rely on contractual instruments to ensure fair value allocation when collaboration is compromised by mistrust and threats to value capture (Barbic et al., 2021; Hurmelinna-Laukkanen & Ritala, 2010).

In situations where firms collaborate with an external, firm-initiated, or open-source community, factors that contribute to firm value capture are related to active engagement with, and contribution to, community-produced goods (Erickson, 2018; Nagle, 2018). This process is facilitated by a continuous flow of communication between a firm and its respective external community (Elia et al., 2020). In addition, firms can openly reveal internal knowledge or product information to the external community to receive suggestions for improvement. However, the lack of long-term roadmaps and the more informal nature of open communities can make it difficult for the firm to capture immediate financial value (Morgan & Finnegan, 2014; Shaikh & Levina, 2019). Therefore, it is essential to have realistic expectations about value capture and the time required to achieve it. Interestingly, research on firm collaboration with an unknown outside community has not addressed the influence of having a clear strategy, trust between partners, and partner selection on value capture. This might not be because these factors are less relevant but rather because they are more difficult to research and manage in this context.

Research on value capture in the crowdsourcing context shows that intermediary platforms between seeker firms and a solver crowd can implement technical features and processes to ensure solver value capture (Kohler, 2015; Kohler & Nickel, 2017). Effective platform features that facilitate non-economic value capture include the implementation of ranking systems (e.g., by awarding stars, points, or trophies), facilitation of solver networking, and recognition of solvers' creative contributions by the firm. If the seeker firm stands to benefit financially from the proposed solution, prize money or revenue-sharing schemes can be used as effective tools to ensure economic value capture for solvers, increasing their satisfaction with the outcome of the collaboration (Kohler, 2015; Kohler & Nickel, 2017). However, if the economic benefit is distributed unevenly and only a few solvers benefit, other solvers may perceive the situation as unfair and withdraw from the crowdsourcing platform.

On a more general level, we find that the influence of having a clear strategy, trust between partners, and partner selection on value capture are only studied in OI collaborations between two for-profit firms or between multiple actors. These factors are largely absent in cases where firms engage in crowdsourcing or solvers contribute to crowdsourcing contests. Furthermore, there are some differences regarding factors influencing financial and non-financial value capture. The influence of asymmetries between partners, collaboration management, and internal changes has been studied for both financial and non-financial value capture. In contrast, with a few exceptions, most articles that study the influence of strategy, trust, and contractual instruments focus on their impact on non-financial value outcomes.

4.4.3. Contextual characteristics influencing value capture

There are a couple of firm and partner characteristics that are important to consider when actors are deciding with whom to engage in collaborative innovation activities. Evidence so far suggests that small and large firms differ in their capability to capture value: Small and medium firms lack the relevant collaboration experience needed to capture value from OI (Bouncken, Fredrich, & Kraus, 2020; Lv et al., 2018). However, small and medium sized firms tend to benefit from collaboration with suppliers, if this enables them to tap into their larger knowledge pools (Guerrero et al., 2022).

Research also shows that the type and characteristics of the partners involved matters. While a range of studies demonstrates that collaborating with all kinds of different partners increases firm financial/non-financial value capture (Arant et al., 2019; Montoro-Sánchez et al., 2011; Sarpong & Teirlinck, 2018; Triguero & Fernández, 2018; Zhang et al., 2022), Foege et al. (2017) found that firms collaborating with customers and suppliers may be especially prone to imitation risks. Moreover, collaborating with firms from different industries positively impacts value capture, whereas collaboration with firms from the same industry does not (Belderbos et al., 2014; Shkolnykova & Kudic, 2022). Not only the type of partner involved but also specific partner characteristics, such as their knowledge base or position in a network, influences the relationship between OI and value capture. While firms collaborating with research institutes capture more value if their partners have a different knowledge base (Arant et al., 2019), firms involved in OI processes with other for-profit firms capture more value if their partners share a similar knowledge base (Runge et al., 2022; Yan et al., 2020) or possess special expertise in a certain area (Bouncken, Fredrich, Ritala, & Kraus, 2020). However, when the external partner has high network prominence and is well connected to other industry members, value capture may be diminished (Ozmel et al., 2017).

A range of studies touch upon the effects of absorptive capacity in the relationship between OI and value capture. Focal firms that possess high absorptive capacity, measured for example as a large stock of patents or investments in R&D personnel, are likely to capture more financial/non-financial value from OI (e.g., Devarakonda et al., 2022; Grimaldi et al., 2021). It has also been shown that this ability to absorb external knowledge is a necessary mediator in the relationship between OI and value capture (Chen et al., 2021; Garcia Martinez et al., 2017; Wu et al., 2013; Zhang et al., 2019). However, in low-tech industries this mediation effect may be weakened (Garcia Martinez et al., 2017). Contrary to the above findings, two studies find absorptive capacity to have a negative effect on value capture (Jirjahn & Kraft, 2011; Wang & Jiang, 2020). This was observed in an innovation setting not based on collaboration but on observation of competitors and other settings of knowledge spillovers.

Lastly, the capacity of firms to capture value from OI is significantly influenced by the business or market environment in which they operate. Firms active in low-tech industries might capture more value from having a diverse collaboration portfolio than firms in high-tech industries (Garcia Martinez et al., 2017). Furthermore, value capture from OI is amplified when firms operate within a highly developed market environment that fosters innovative behavior (Chen et al., 2019) and are active in an industry with a strong industrial network (Zhang et al., 2019). Knowledge pools within the market play an important role. Research indicates that firms engaged in collaborative innovation activities benefit more when located in regions with higher knowledge capacities. Typical indicators used to measure this capacity are the number of patents or research expenditures by private firms in that region (Guerrero et al., 2022; Tojeiro-Rivero & Moreno, 2019).

5. A research agenda on value capture in OI

Our integrative literature review reveals that value is primarily understood and measured in financial terms, with a strong focus on the role and interests of organizations in value capture. It also highlights the need for active management of OI activities to successfully capture value. Based on these findings, four research areas are identified as particularly important for advancing our understanding of value capture in and through OI. Table 5 presents potential research questions associated with these four areas.

5.1. Research area 1: Advancing the understanding of concepts and measurements of value capture in OI

The first research area that needs further exploration is related to the concepts and measures of value that can be captured in OI. Our analysis in Section 4.2 has shown that research is evenly distributed between financial and non-financial value outcomes of OI. However, it is noteworthy that research on OI where the collaboration partner is known in advance rarely considers these two measurements of value jointly and instead views them as distinct outcomes of collaborative innovation activities. These two different value outcomes can be linked to the discussion on appropriability (i.e., potential value capture) and appropriation (i.e., realized value capture) (Hurmelinna-Laukkanen & Yang, 2022). In our case, financial value indicators represent realized profits after the successful termination of the collaboration. Non-financial value indicators have the potential for future realized value capture and can be considered as partial results during an ongoing collaboration (Takahashi & Takahashi, 2022). This calls for a discussion on the interplay between financial and non-financial value in OI. Solely focusing on one type of value capture could pose problems, as it may conceal potential benefits of OI in other areas, resulting in firms failing to recognize the full potential of OI activities. Therefore, future research should focus on the combination of both financial and non-financial value capture to gain a better understanding of all potential types of value that collaborative innovation activities generate throughout the entire lifecycle of OI. By gaining a more comprehensive understanding of the various types of values that can be captured in OI, firms can enhance their strategic planning and effectively mitigate the risk of 'unsystematic implementation' of OI practices (Abhari & McGuckin, 2023).

Second, since OI can lead to a broad range of captured values, there is a need to better understand which values are most important for each actor involved. Our analyses in sections 4.2 and 4.3 revealed that both financial and non-financial values can be captured by various actors. However, if the goals of actors are not aligned, there is a risk that the collaboration will fail (Garcia et al., 2019). Recent evidence suggests that actor motivation in OI is not limited to financial value capture, but also includes non-financial factors such as corporate social responsibility, marketing concerns, and brand loyalty (Greco, Campagna, Cricelli, Grimaldi, & Strazzullo, 2022; O'Brien, Jarvis, & Soutar, 2015). For example, during the Covid-19 pandemic crisis, firms engaged in incremental or radical innovation with external actors not only for industrial motivations such as new opportunities or revenue streams, but also for institutional motivations such as corporate social responsibility or marketing concerns (Greco et al., 2022). The interplay between actors' goals and the success of OI can be especially challenging in the case of OI with a crowd of solvers where actors lack shared collaboration experiences, trust has not been established, and there is uncertainty about what other actors expect. According to recent evidence, when crowdsourcing solvers are given the chance to choose their preferred reward from a range of options, rather than being offered a single option, there is a significant improvement in the quality of the solutions they provide (Moghaddam et al., 2023). Therefore, further research is needed to investigate the different expectations of value capture and the underlying motivations for actors to engage in external collaborations for innovation purposes. For instance, this could involve studying the relative importance of financial versus non-financial value outcomes in different OI contexts. Shedding light on this matter is crucial as it has direct implications for the level of satisfaction with the ultimate outcome of the OI activity and the success of the collaboration as a whole.

Third, our findings concerning what value is captured suggest that there may be novel measures requiring further validation and conceptualization. For example, many studies have explored intellectual value as non-financial value measure, looking for indicators such as important information about new technology (Bien et al., 2014), technological, market, and managerial knowledge (Reypens et al., 2016), or business, cooperation, and intellectual value (Takahashi & Takahashi, 2022). Another example is innovation quality, which has been assessed by asking managers about customer satisfaction with new or improved products (Williams & Vossen, 2014), new customer benefits of new or improved products (Bouncken, Fredrich, Ritala, & Kraus, 2020), or the performance of new or improved products relative to competitors (Wang & Jiang, 2020). As these two examples demonstrate, most non-financial value outcomes are challenging to measure and are not yet comparable across studies. Consequently, future research could concentrate on developing valid and comparable measures for non-financial value, such as reputation, market knowledge, or environmental value, which can be captured through OI. This would improve the ability to capture and compare the full range of benefits of OI.

Table 5
Potential research questions for an improved understanding of value capture in open innovation.

Perspective	Potential research questions
Research area 1: Concepts and measures of value	What are the OI contexts in which financial and non-financial value capture concerns are complementary, and in which contexts are they treated as independent? Is it necessary for the financial and non-financial value capture intentions of OI partners to align? What approaches can be used to develop valid and comparable measures that encompass the different types of non-financial value that can be captured in OI?
Research area 2: Contextual factors	What is the impact of firm and collaboration characteristics, such as technological expertise and knowledge resources, on the capture value potential in OI? Given the resource-constraint state of smaller firms, is firm size always a disadvantage for capturing value in OI collaborations, or are there situations in which smaller firms can be just as successful as larger firms? What is the impact of the location of OI partners on their ability to capture value? Is the type of value or the process of value capture contingent on geographical contexts and distance between partners?
Research area 3: Dynamics of value capture	Does engaging in OI influence the speed at which value is captured (e.g., knowledge is acquired, product/services are developed)? Do firms prioritize partners based on their ability to capture certain types of value, and how does this affect the success of the collaboration? How does the importance of capturing value change throughout the different stages of the OI lifecycle?
Research area 4: Societal value	What motivates firms to engage in OI activities where the majority of the value created is captured at the system level rather than at the firm level? How can the captured value at the system level be translated or transferred to the firm level so that all actors benefit from the OI activity? What value capture factors or mechanisms can be identified from successful OI activities aimed at addressing wicked problems?

5.2. Research area 2: Advancing understanding of the impact of contextual factors on value capture in OI

The second area of research addresses the role of firm and collaboration characteristics in facilitating or hindering value capture in OI. Our findings on how value is captured in OI (see Section 4.4) reveal several situational conditions that influence actual firm value capture once the collaboration is established. Despite OI being practiced in diverse contexts, our understanding of the role of contextual factors in shaping value capture by different actors remains limited. For example, most empirical evidence on value capture originates from studies using data from established firms or multinational enterprises. There is a research gap concerning the transferability of existing evidence on mechanisms and factors that contribute to value capture for newly established or younger firms in a resource-constrained state[4] (Freeman, Carroll, & Hannan, 1983). Additionally, our analysis shows that the focal firm's value capture depends on the expertise and network position of the OI partner (Bouncken, Fredrich, Ritala, & Kraus, 2020; Ozmel et al., 2017), the compatibility between partners (Runge et al., 2022; Yan et al., 2020), knowledge resources of the focal firm (Chen et al., 2021; Devarakonda et al., 2022) and differs for SMEs and larger firms (Lv et al., 2018). This illustrates that a multitude of focal firm, collaboration partner, and situational factors influence actual value capture in OI. For example, Schäper et al. (2023) recently demonstrated that the relationship between OI and financial performance might be S-shaped and vary according to the institutional setting. Utilizing machine-learning content analysis, they create a longitudinal measure of firms' degree of openness and show that financial performance is highest for closed innovation and medium levels of OI. Additionally, this relationship is more pronounced in industries with tight appropriability regime and weaker in dynamic industries. Our understanding of these situational conditions is still limited and requires further research attention.

Next to differences among actor types, it is also important to consider variations in the geographical context where actors operate. In fact, research on value capture in OI has largely neglected the territorial dimension of the underlying processes and has failed to connect its findings to the extensive literature on regional clusters and regional innovation systems (Simard & West, 2006). Geography can play a role in various ways. For instance, certain forms of value may be easier to capture from proximate actors rather than distant ones: there is, for example, evidence that technology licensing typically focuses on licensees from the same region of the licensor (Losacker, 2022). Broadly speaking, geographical and institutional contexts shape the norms and regulations influencing the opportunities or barriers for value capture (Cooke, 2005; Torres de Oliveira, Verreynne, Figueira, Indulska, & Steen, 2022). Some attempts have been made to incorporate insights from geography into studies focusing on how companies organize their OI activities in general (e.g., Laursen, Masciarelli, & Prencipe, 2012). Value capture activities could also be studied more through a geographical lens, exploring whether companies are more likely to prioritize non-financial value capture with partners that are spatially proximate, part of the same cluster, or in regions with higher social capital. Recent research employing a geography of collaboration lens shows that there is limited value capture for firms active in creative industries that engage in OI outside regional markets (Audretsch & Belitski, 2023). Further investigations are needed to better map the heterogeneity of OI value capture processes in space.

[4] The literature review by Spender, Corvello, Grimaldi, and Rippa (2017) on startups and OI briefly discusses the influence of collaborative relationships on the performance of startups.

5.3. Research area 3: Advancing a dynamic perspective on value capture in OI

The third area of future research addresses the knowledge gap regarding the dynamics of value capture, as most studies are cross-sectional. As described in Section 4.4 of the analysis, research shows that firms initiate OI activities with a specific value capture goal, which is likely to change throughout the process (e.g., Garcia et al., 2019; Radziwon et al., 2017; Shaikh & Levina, 2019). Research suggests that taking a temporal, process-oriented perspective in OI can be beneficial (Bahemia, Sillince, & Vanhaverbeke, 2018; de Melo, Salerno, Freitas, Bagno, & Brasil, 2021; Zynga et al., 2018). By breaking up an OI activity into distinct phases, it becomes possible to identify specific considerations essential for OI to realize its full potential. As a result, the type of value that can and should be captured through various mechanisms at different phases of the innovation process may also be influenced. This suggests that value capture is not merely a static phenomenon occurring at a certain point in time, typically upon collaboration completion, but rather it must be continuously considered during the collaboration with external actors (Reypens et al., 2016; Takahashi & Takahashi, 2022). This necessitates a more dynamic perspective on value capture in OI research. For example, researchers could examine whether firms that engage in OI can capture certain types of value more quickly than those involved in closed innovation (Milan, Ulrich, Faria, & Li-Ying, 2020; Toroslu, Herrmann, Chappin, Schemmann, & Castaldi, 2023).

The study of value capture dynamics can also be linked to issues raised in research area one. The importance and actual capture of different financial and non-financial values might vary across different phases of the innovation process. For example, when seeking suitable OI partners, firms consider factors such as complementarity, compatibility, and previous collaboration experiences (Arsanti, Rupidara, & Bondarouk, 2022; Manotungvorapun & Gerdsri, 2016; Solesvik & Gulbrandsen, 2013), as well as value appropriation opportunities (Diestre & Rajagopalan, 2012). Once the OI activity is established, questions arise concerning the temporal dimension of value capture. For example, researchers could examine whether OI partners are satisfied with receiving financial results at the end of the collaboration, or if tangible outcomes are required during the ongoing OI activity to keep partners engaged. It would also be important to comprehend what types of value (financial and/or non-financial) actors capture at each stage of the OI lifecycle and how it affects their interest in OI and the likelihood of success (Stefan & Bengtsson, 2017). This aspect remains underresearched and warrants further investigation.

5.4. Research area 4: Advancing the capture of societal value in the face of wicked problems

The fourth area of future research concerns the role of value capture in OI in the face of major societal and environmental challenges. Our results show that OI can be a useful strategy for increasing network or environmental value (Garcia et al., 2019; Kim et al., 2019; Li-Ying et al., 2018; Reypens et al., 2016). However, firms are often reluctant to engage in co-creation when most of the resulting value is captured at the network or societal level (Garcia et al., 2019). This presents a challenge to the effective use of OI in addressing societal challenges or other wicked problems (Dahlander et al., 2021). Such challenges are characterized by high levels of complexity and task uncertainty, and therefore demand attention and contribution of more than a single actor. At the societal level, governments can step in to establish monetary and non-monetary support systems to influence firm decisions when implementing and managing OI activities (Ogink, Goossen, Romme, & Akkermans, 2022).

In the face of such challenges, some firms have already opted to participate in OI. Examples of this include creating joint ventures in the automotive industry to develop sustainable alternatives or becoming part of the Open Covid Pledge to offer free licenses to intellectual

property that is otherwise restricted (McGahan, Bogers, Chesbrough, & Holgersson, 2021). Recently, this topic has garnered the attention of researchers who have examined the strengths and weakness of OI in addressing wicked problems (Ooms & Piepenbrink, 2021; Randhawa, West, Skellern, & Josserand, 2021; Seran & Bez, 2021). For instance, organizations can promote ecosystem development and encourage innovation by facilitating "outside-out" or "sideways" knowledge flows among external actors (Attalah, Nylund, & Brem, 2023; Gutmann, Chochoiek, & Chesbrough, 2023). In such situations, value capture mechanisms are necessary not only at the firm level, but also at the system or societal level, as the latter has a more 'silent' interest in the success of the collaboration. The extent to which OI can be beneficial in addressing and solving present and future wicked problems depends largely on this tension between firm value creation and system value capture, as well as the unpredictability and distance of value capture by the firm. As De Silva, Gokhberg, Meissner, and Russo (2021) demonstrate with their conceptual framework, science-based co-creation generates a range of social and business values (i.e. 'dual'). However, its success depends on firms acknowledging that science-based collaborations are not purely financially motivated while at the same time they create some type of business value for the firm to capitalize on. Therefore, to fully comprehend the potential of OI, it is necessary to move beyond bilateral collaborations between firms and consider its broader impact on the larger societal or natural context (Bertello, Bogers, & De Bernardi, 2022).

5.5. Limitations, managerial implications, and conclusions

While our integrative literature review has provided valuable insights into value capture in OI, there are limitations that should be considered. First, we only focused on empirical articles, which may have limited our understanding of the conceptual and theoretical aspects of value capture in OI. Future research could benefit from incorporating conceptual and theoretical articles to gain a more comprehensive understanding of the topic. Second, our analysis of the selected articles was guided by three specific questions of 'what', 'who' and 'how'. These three key questions were derived from existing OI literature and intentionally framed in a broad manner. While analyzing the literature, we did not encounter another broad theme of value capture touched on by the selected articles. Nonetheless, they shaped the focus of our analysis of the literature. Therefore, we encourage future researchers to investigate alternative aspects to gain further insights into value capture in OI.

In spite of these limitations, our findings systematize and integrate existing evidence-based insights on value capture in OI. Our review bears managerial implications too. Managers of firms engaged in or considering to engage in OI can use the research evidence presented in this paper to inform their OI strategies. As noted in the introduction, there is plenty of evidence that firms struggle to properly account for the complexities and challenges of value capture in OI. Such issues can jeopardize the efforts of building OI strategies in the first place. Based on our review findings we can offer managers a tentative 'checklist'. The 'what' question alerts managers of the different values that can be captured, the 'who' question reminds them of the different actors involved and the 'how' question informs them of the different ways in which value can be captured.

First, regarding the types of value that can be captured managers should consider *what* they want to gain from using OI. To harness the full potential of OI they should not only focus on financial measures of value (e.g., product sales or revenue/profits), instead they should also pay attention to non-financial measures of value (in particular: new or improved products/services/processes, intellectual value, patents granted/cited, innovation quality, or new partnerships/customers) – especially when openly innovating with ex-ante unknown partners. Some of the non-financial value is likely to lead to future financial value capture. When considering what could be captured, managers also need to be aware that involvement in OI could, if not well managed, also lead to financial or non-financial value losses in case of IP infringements or through unwanted imitation or knowledge spillovers.

Second, managers should consider *who* wants to capture value from the OI process/project and what their needs and interests are. Thereby it is not only important to consider the value capture needs of other organizations involved, but to also understand interests of individual actors or networks. They must also be aware that the value capture of actors not directly involved in the OI activity may also be affected.

Third, managers are advised to carefully consider *how* they design and administrate the OI process. When selecting innovation collaboration partners, managers must be aware of their own firm's characteristics and the characteristics of potential partners. As a precondition for value capture, the focal firm especially in high-tech industries must significantly investment in internal R&D and knowledge capacities, enabling them to effectively absorb and integrate externally generated knowledge. Regarding the characteristics of collaboration partners, value capture is usually enhanced when partners share a similar knowledge base or when partners possess more knowledge resources than the focal firm.

Once the OI process is established, there are various ways in which managers can actively influence the value capture potential. This involves setting clear value capture goals, defining roles and responsibilities through contractual agreements, and fostering effective coordination and cooperation among all parties involved. This includes developing suitable incentives for each actor. To unlock the full potential of OI, managers should avoid an imbalance in the amount of value captured by the actors involved, as this may negatively influence the willingness of some actors to co-create and bear innovation costs. This can ultimately even lead to failure of collaborations and projects. Transparent guidelines, performance metrics, and reward systems should therefore be established to develop trust and to motivate all partners to actively contribute and engage in collaborative innovation efforts. Lastly, managers are advised to strategically use formal and informal protection mechanisms (such as patents, trademarks, secrecy, or the selective revealing of information) that can positively impact value capture while also reducing the risk of intellectual property infringement from collaboration partners.

Ideally, all actors want to be better off after engaging in OI (Chesbrough et al., 2018). Assuming we develop a deeper understanding of what each actor wants to capture, it is critical to study how firms or even governments, in the case of societal/environmental value, can implement mechanisms to ensure successful value capture for all stakeholders, not just the focal firm. Otherwise, participation in OI activities may not be attractive or sustainable. To facilitate this discussion, we have identified and proposed four key research areas to advance our understanding of value capture in OI. These four trajectories relate to: 1) Expanding concepts and measures of value; 2) advancing insights on contextual conditions that characterize the OI activity and establish value capture potential; 3) improving our understanding of the dynamics of value capture throughout the entire lifecycle of OI; and 4) addressing value capture issues when tackling major societal and environmental challenges of our time.

Funding

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

Declaration of Competing Interest

None.

Data availability

No data was used for the research described in the article.

Appendix

Table A.1
Overview of articles that address the combination of *what* and *how* value is captured in OI.

	Value capture mechanisms	Factors facilitating / hindering value capture	Contextual characteristics influencing value capture
Financial value	Chanal and Caron-Fasan (2010), Leten et al. (2013), Demil and Lecocq (2014), Wadhwa et al. (2017), Erickson (2018), de Oliveira et al. (2021), Grimaldi et al. (2021)	Chanal and Caron-Fasan (2010), Bien et al. (2014), Morgan and Finnegan (2014), Williams and Vossen (2014), Kohler (2015), Kohler and Nickel (2017), Wadhwa et al. (2017), Erickson (2018), Nagle (2018), Basterretxea et al. (2019), Shaikh and Levina (2019), Bouncken, Fredrich, and Kraus (2020), Dell'Era et al. (2020), Pedersen et al. (2022)	Jirjahn and Kraft (2011), Montoro-Sánchez et al. (2011), Wu et al. (2013), Belderbos et al. (2014), Díez-Vial and Fernández-Olmos (2015), Garcia Martinez et al. (2017), Zhang et al. (2017), Lv et al. (2018), Sarpong and Teirlinck (2018), Chen et al. (2019), Zhang et al. (2019), Bouncken, Fredrich, and Kraus (2020), Hani and Dagnino (2020), Ko et al. (2020), Zhang et al. (2020), Bernal et al. (2022), Guerrero et al. (2022), Seo and Park (2022)
Non-financial value	Chanal and Caron-Fasan (2010), Hurmelinna-Laukkanen and Ritala (2010), Leten et al. (2013), Demil and Lecocq (2014), Foege et al. (2017), Stefan and Bengtsson (2017), Erickson (2018), Elia et al. (2020), Heidemann Lassen et al. (2020)	Chanal and Caron-Fasan (2010), Hurmelinna-Laukkanen and Ritala (2010), Napp and Minshall (2011), Bien et al. (2014), Morgan and Finnegan (2014), Williams and Vossen (2014), Kohler (2015), Reypens et al. (2016), Kohler and Nickel (2017), Radziwon et al. (2017), Erickson (2018), Garcia et al. (2019), Kim et al. (2019), Shaikh and Levina (2019), Elia et al. (2020), Ahlfänger et al. (2022), Devarakonda et al. (2022), Takahashi and Takahashi (2022)	Simonen and McCann (2008), Adegbesan and Higgins (2011), Fernandes and Ferreira (2013), Arora et al. (2016), Foege et al. (2017), Ozmel et al. (2017), Li-Ying et al. (2018), Triguero and Fernández (2018), Arant et al. (2019), Tojeiro-Rivero and Moreno (2019), Bouncken, Fredrich, Ritala, and Kraus (2020), Fitjar and Rodríguez-Pose (2020), Hani and Dagnino (2020), Wang and Jiang (2020), Yan et al. (2020), Zhang et al. (2020), Chen et al. (2021), Murgia (2021), Devarakonda et al. (2022), Runge et al. (2022), Seo and Park (2022), Shkolnykova and Kudic (2022), Zhang et al. (2022)

References

Abhari, K., & McGuckin, S. (2023). Limiting factors of open innovation organizations: A case of social product development and research agenda. *Technovation, 119*, Article 102526. https://doi.org/10.1016/j.technovation.2022.102526

Adegbesan, J. A., & Higgins, M. J. (2011). The intra-alliance division of value created through collaboration. *Strategic Management Journal, 32*(2), 187–211. https://doi.org/10.1002/smj.872

Ahlfänger, M., Gemünden, H. G., & Leker, J. (2022). Balancing knowledge sharing with protecting: The efficacy of formal control in open innovation projects. *International Journal of Project Management, 40*(2), 105–119. https://doi.org/10.1016/j.ijproman.2021.09.007

Arant, W., Fornahl, D., Grashof, N., Hesse, K., & Söllner, C. (2019). University-industry collaborations—The key to radical innovations? *Review of Regional Research, 39*(2), 119–141. https://doi.org/10.1007/s10037-019-00133-3

Arora, A., Athreye, S., & Huang, C. (2016). The paradox of openness revisited: Collaborative innovation and patenting by UK innovators. *Research Policy, 45*(7), 1352–1361. https://doi.org/10.1016/j.respol.2016.03.019

Arsanti, T. A., Rupidara, N. S., & Bondarouk, T. (2022). How to find the right partner? Open innovation partner selection process. *Administrative Sciences, 12*(4), 165. https://doi.org/10.3390/admsci12040165

Attalah, I., Nylund, P. A., & Brem, A. (2023). Who captures value from hackathons? Innovation contests with collective intelligence tools bridging creativity and coupled open innovation. *Creativity and Innovation Management*. https://doi.org/10.1111/caim.12552

Audretsch, B. D., & Belitski, M. (2023). The limits to open innovation and its impact on innovation performance. *Technovation, 119*, Article 102519. https://doi.org/10.1016/j.technovation.2022.102519

Bahemia, H., Sillince, J., & Vanhaverbeke, W. (2018). The timing of openness in a radical innovation project, a temporal and loose coupling perspective. *Research Policy, 47*(10), 2066–2076. https://doi.org/10.1016/j.respol.2018.07.015

Barbic, F., Jolink, A., Niesten, E., & Hidalgo, A. (2021). Opening and closing open innovation projects: A contractual perspective. *Industrial Marketing Management, 94*, 174–186. https://doi.org/10.1016/j.indmarman.2021.02.014

Barge-Gil, A. (2013). Open strategies and innovation performance. *Industry and Innovation, 20*(7), 585–610. https://doi.org/10.1080/13662716.2013.849455

Basterretxea, I., Charterina, J., & Landeta, J. (2019). Coopetition and innovation. Lessons from worker cooperatives in the Spanish machine tool industry. *The Journal of Business and Industrial Marketing*. https://doi.org/10.1108/JBIM-01-2018-0015

Belderbos, R., Cassiman, B., Faems, D., Leten, B., & Van Looy, B. (2014). Co-ownership of intellectual property: Exploring the value-appropriation and value-creation implications of co-patenting with different partners. *Research Policy, 43*(5), 841–852. https://doi.org/10.1016/j.respol.2013.08.013

Belderbos, R., Gilsing, V., Lokshin, B., Carree, M., & Sastre, J. F. (2018). The antecedents of new R&D collaborations with different partner types: On the dynamics of past R&D collaboration and innovative performance. *Long Range Planning, 51*(2), 285–302. https://doi.org/10.1016/j.lrp.2017.10.002

Bernal, P., Carree, M., & Lokshin, B. (2022). Knowledge spillovers, R&D partnerships and innovation performance. *Technovation, 115*, Article 102456. https://doi.org/10.1016/j.technovation.2022.102456

Bertello, A., Bogers, M. L., & De Bernardi, P. (2022). Open innovation in the face of the COVID-19 grand challenge: Insights from the Pan-European hackathon 'EUvsVirus'. *R&D Management, 52*(2), 178–192. https://doi.org/10.1111/radm.12456

Bien, H.-J., Ben, T.-M., & Wang, K.-F. (2014). Trust relationships within R&D networks: A case study from the biotechnological industry. *Innovation, 16*(3), 354–373. https://doi.org/10.1080/14479338.2014.11081993

Bogers, M. (2011). The open innovation paradox: Knowledge sharing and protection in R&D collaborations. *European Journal of Innovation Management*. https://doi.org/10.1108/14601061111104715

Bogers, M., Chesbrough, H. W., & Moedas, C. (2018). Open innovation: Research, practices, and policies. *California Management Review, 60*(2), 5–16. https://doi.org/10.1177/0008125617745086

Bogers, M., & West, J. (2012). Managing distributed innovation: Strategic utilization of open and user innovation. *Creativity and Innovation Management, 21*(1), 61–75. https://doi.org/10.1111/j.1467-8691.2011.00622.x

Bogers, M., Zobel, A.-K., Afuah, A., Almirall, E., Brunswicker, S., Dahlander, L., Frederiksen, L., Gawer, A., Gruber, M., & Haefliger, S. (2017). The open innovation research landscape: Established perspectives and emerging themes across different levels of analysis. *Industry and Innovation, 24*(1), 8–40. https://doi.org/10.1080/13662716.2016.1240068

Bouncken, R. B., Fredrich, V., & Kraus, S. (2020). Configurations of firm-level value capture in coopetition. *Long Range Planning, 53*(1). https://doi.org/10.1016/j.lrp.2019.02.002. Article 101869.

Bouncken, R. B., Fredrich, V., Ritala, P., & Kraus, S. (2020). Value-creation-capture-equilibrium in new product development alliances: A matter of coopetition, expert power, and alliance importance. *Industrial Marketing Management, 90*, 648–662. https://doi.org/10.1016/j.indmarman.2020.03.019

Bowman, C., & Ambrosini, V. (2000). Value creation versus value capture: Towards a coherent definition of value in strategy. *British Journal of Management, 11*(1), 1–15. https://doi.org/10.1111/1467-8551.00147

Chanal, V., & Caron-Fasan, M. L. (2010). The difficulties involved in developing business models open to innovation communities: The case of a crowdsourcing platform. *Management, 13*(4), 318–341. https://doi.org/10.3917/mana.134.0318

Chen, H., Yao, Y., Zan, A., & Carayannis, E. G. (2021). How does coopetition affect radical innovation? The roles of internal knowledge structure and external knowledge integration. *The Journal of Business and Industrial Marketing*. https://doi.org/10.1108/JBIM-05-2019-0257

Chen, H., Zeng, S., Yu, B., & Xue, H. (2019). Complementarity in open innovation and corporate strategy: The moderating effect of ownership and location strategies. *IEEE Transactions on Engineering Management, 67*(3), 754–768. Article 8625450 https://doi.org/10.1109/TEM.2018.2889804.

Chesbrough, H. W. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business Press.

Chesbrough, H. W., & Bogers, M. (2014). Explicating open innovation: Clarifying an emerging paradigm for understanding innovation. In H. W. Chesbrough, W. Vanhaverbeke, & J. West (Eds.), *New frontiers in open innovation* (pp. 3–28).

Forthcoming: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199682461.003.0001.
Chesbrough, H. W., Lettl, C., & Ritter, T. (2018). Value creation and value capture in open innovation. *Journal of Product Innovation Management, 35*(6), 930–938. https://doi.org/10.1111/jpim.12471
Chesbrough, H. W., & Rosenbloom, R. S. (2002). The role of the business model in capturing value from innovation: Evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change, 11*(3), 529–555. https://doi.org/10.1093/icc/11.3.529
Cooke, P. (2005). Regionally asymmetric knowledge capabilities and open innovation: Exploring 'Globalisation 2'—A new model of industry organisation. *Research Policy, 34*(8), 1128–1149. https://doi.org/10.1016/j.respol.2004.12.005
Cricelli, L., Grimaldi, M., & Vermicelli, S. (2022). Crowdsourcing and open innovation: A systematic literature review, an integrated framework and a research agenda. *Review of Managerial Science, 16*(5), 1269–1310. https://doi.org/10.1007/s11846-021-00482-9
Dahlander, L., & Gann, D. M. (2010). How open is innovation? *Research Policy, 39*(6), 699–709. https://doi.org/10.1016/j.respol.2010.01.013
Dahlander, L., Gann, D. M., & Wallin, M. W. (2021). How open is innovation? A retrospective and ideas forward. *Research Policy, 50*(4), Article 104218. https://doi.org/10.1016/j.respol.2021.104218
De Silva, M., Gokhberg, L., Meissner, D., & Russo, M. (2021). Addressing societal challenges through the simultaneous generation of social and business values: A conceptual framework for science-based co-creation. *Technovation, 104*, Article 102268. https://doi.org/10.1016/j.technovation.2021.102268
Dedrick, J., & Kraemer, K. L. (2015). Who captures value from science-based innovation? The distribution of benefits from GMR in the hard disk drive industry. *Research Policy, 44*(8), 1615–1628. https://doi.org/10.1016/j.respol.2015.06.011
Dell'Era, C., Di Minin, A., Ferrigno, G., Frattini, F., Landoni, P., & Verganti, R. (2020). Value capture in open innovation processes with radical circles: A qualitative analysis of firms' collaborations with Slow Food, Memphis, and Free Software Foundation. *Technological Forecasting and Social Change, 158*. https://doi.org/10.1016/j.techfore.2020.120128. Article 120128.
Demil, B., & Lecocq, X. (2014). The rise and fall of an open business model. *Revue d'Économie Industrielle, 146*(2), 85–113. https://doi.org/10.4000/rei.5803
Devarakonda, R., Reuer, J. J., & Tadikonda, H. (2022). Founder social capital and value appropriation in R&D alliance agreements. *Research Policy, 51*(4), Article 104474. https://doi.org/10.1016/j.respol.2022.104474
Diestre, L., & Rajagopalan, N. (2012). Are all 'sharks' dangerous? New biotechnology ventures and partner selection in R&D alliances. *Strategic Management Journal, 33*(10), 1115–1134. https://doi.org/10.1002/smj.1978
Díez-Vial, I., & Fernández-Olmos, M. (2015). Knowledge spillovers in science and technology parks: How can firms benefit most? *The Journal of Technology Transfer, 40*(1), 70–84. https://doi.org/10.1007/s10961-013-9329-4
Dutton, W. H. (2008). The wisdom of collaborative network organizations: Capturing the value of networked individuals. *Prometheus (United Kingdom), 26*(3), 211–230. https://doi.org/10.1080/08109020802270182
Ebersberger, B., Bloch, C., Herstad, S. J., & Van De Velde, E. (2012). Open innovation practices and their effect on innovation performance. *International Journal of Innovation and Technology Management, 9*(06), 1250040. https://doi.org/10.1142/S021987701250040X
Ebersberger, B., Galia, F., Laursen, K., & Salter, A. (2021). Inbound open innovation and innovation performance: A robustness study. *Research Policy, 50*(7), Article 104271. https://doi.org/10.1016/j.respol.2021.104271
Elia, G., Messeni Petruzzelli, A., & Urbinati, A. (2020). Implementing open innovation through virtual brand communities: A case study analysis in the semiconductor industry. *Technological Forecasting and Social Change, 155*. https://doi.org/10.1016/j.techfore.2020.119994. Article 119994.
Erickson, K. (2018). Can creative firms thrive without copyright? Value generation and capture from private-collective innovation. *Business Horizons, 61*(5), 699–709. https://doi.org/10.1016/j.bushor.2018.04.005
Fernandes, C. I., & Ferreira, J. J. (2013). Knowledge spillovers: Cooperation between universities and KIBS. *R&D Management, 43*(5), 461–472. https://doi.org/10.1111/radm.12024
Fitjar, R. D., & Rodríguez-Pose, A. (2020). Where cities fail to triumph: The impact of urban location and local collaboration on innovation in Norway. *Journal of Regional Science, 60*(1), 5–32. https://doi.org/10.1111/jors.12461
Foege, J. N., Lauritzen, G. D., Tietze, F., & Salge, T. O. (2019). Reconceptualizing the paradox of openness: How solvers navigate sharing-protecting tensions in crowdsourcing. *Research Policy, 48*(6), 1323–1339. https://doi.org/10.1016/j.respol.2019.01.013
Foege, J. N., Piening, E. P., & Salge, T. O. (2017). Don't get caught on the wrong foot: A resource-based perspective on imitation threats in innovation partnerships. *International Journal of Innovation Management, 21*(3). https://doi.org/10.1142/S1363919617500232. Article 1750023.
Franke, N., Keinz, P., & Klausberger, K. (2013). "Does this sound like a fair deal?": Antecedents and consequences of fairness expectations in the individual's decision to participate in firm innovation. *Organization Science, 24*(5), 1495–1516. https://doi.org/10.1287/orsc.1120.0794
Freeman, J., Carroll, G. R., & Hannan, M. T. (1983). The liability of newness: Age dependence in organizational death rates. *American Sociological Review, 48*(5), 692–710. https://doi.org/10.2307/2094928
Garcia Martinez, M., Zouaghi, F., & Sanchez Garcia, M. (2017). Capturing value from alliance portfolio diversity: The mediating role of R&D human capital in high and low tech industries. *Technovation, 59*, 55–67. https://doi.org/10.1016/j.technovation.2016.06.003
Garcia, R., Wigger, K., & Hermann, R. R. (2019). Challenges of creating and capturing value in open eco-innovation: Evidence from the maritime industry in Denmark. *Journal of Cleaner Production, 220*, 642–654. https://doi.org/10.1016/j.jclepro.2019.02.027
Granstrand, O., & Holgersson, M. (2014). The challenge of closing open innovation: The intellectual property disassembly problem. *Research-Technology Management, 57*(5), 19–25. https://doi.org/10.5437/08956308X5705258
Greco, M., Campagna, M., Cricelli, L., Grimaldi, M., & Strazzullo, S. (2022). COVID-19-related innovations: A study on underlying motivations and inter-organizational collaboration. *Industrial Marketing Management, 106*, 58–70. https://doi.org/10.1016/j.indmarman.2022.07.014
Grimaldi, M., Greco, M., & Cricelli, L. (2021). A framework of intellectual property protection strategies and open innovation. *Journal of Business Research, 123*, 156–164. https://doi.org/10.1016/j.jbusres.2020.09.043
Guerrero, A. J., Heijs, J., & Huergo, E. (2022). The effect of technological relatedness on firm sales evolution through external knowledge sourcing. *The Journal of Technology Transfer, 1-39*. https://doi.org/10.1007/s10961-022-09931-3
Gutmann, T., Chochoiek, C., & Chesbrough, H. (2023). Extending open innovation: Orchestrating knowledge flows from corporate venture capital investments. *California Management Review, 00081256221147342*. https://doi.org/10.1177/00081256221147342
Hani, M., & Dagnino, G. B. (2020). Global network coopetition, firm innovation and value creation. *The Journal of Business and Industrial Marketing*. https://doi.org/10.1108/JBIM-05-2019-0268
Heidemann Lassen, A., Ljungberg, D., & McKelvey, M. (2020). Promoting future sustainable transition by overcoming the openness paradox in KIE firms. *Sustainability, 12*(24), 10567. https://doi.org/10.3390/su122410567
Hossain, M., & Islam, K. Z. (2015). Generating ideas on online platforms: A case study of "My Starbucks Idea". *Arab Economic and Business Journal, 10*(2), 102–111. https://doi.org/10.1016/j.aebj.2015.09.001
Huang, M.-H., & Rust, R. T. (2017). Technology-driven service strategy. *Journal of the Academy of Marketing Science, 45*(6), 906–924. https://doi.org/10.1007/s11747-017-0545-6
Hurmelinna-Laukkanen, P., & Ritala, P. (2010). Protection for profiting from collaborative service innovation. *Journal of Service Management, 21*(1), 6–24. https://doi.org/10.1108/09564231011025092
Hurmelinna-Laukkanen, P., & Yang, J. (2022). Distinguishing between appropriability and appropriation: A systematic review and a renewed conceptual framing. *Research Policy, 51*(1), Article 104417. https://doi.org/10.1016/j.respol.2021.104417
Jacobides, M. G., Knudsen, T., & Augier, M. (2006). Benefiting from innovation: Value creation, value appropriation and the role of industry architectures. *Research Policy, 35*(8), 1200–1221. https://doi.org/10.1016/j.respol.2006.09.005
Jirjahn, U., & Kraft, K. (2011). Do spillovers stimulate incremental or drastic product innovations? Evidence from German establishment data. *Oxford Bulletin of Economics and Statistics, 73*(4), 509–538. https://doi.org/10.1111/j.1468-0084.2010.00618.x
de Jong, S., Oosterveld, W. T., De Spiegeleire, S., Bekkers, F., Usanov, A., Salah, K. E., … Poláčková, D. (2016). *Better together: Towards a new cooperation portfolio for defense*. The Hague Centre for Strategic Studies.
Kim, J., Cho, S., & Ramesh, B. (2019). IT-leveraged network value cocreation: A case study of the value cocreation process and value capture in the south Korean broadcast advertising industry. *European Journal of Information Systems, 28*(6), 646–662. https://doi.org/10.1080/0960085X.2019.1669494
Ko, Y., Chung, Y., & Seo, H. (2020). Coopetition for sustainable competitiveness: R&D collaboration in perspective of productivity. *Sustainability (Switzerland), 12*(19), 1–18. Article 7993 https://doi.org/10.3390/su12197993.
Kohler, T. (2015). Crowdsourcing-based business models: How to create and capture value. *California Management Review, 57*(4), 63–84. https://doi.org/10.1525/cmr.2015.57.4.63
Kohler, T., & Nickel, M. (2017). Crowdsourcing business models that last. *Journal of Business Strategy, 38*(2), 25–32. https://doi.org/10.1108/JBS-10-2016-0120
Lakhani, K. R., & Lonstein, E. (2008). InnoCentive. com (A). *Harvard Business School Case, 608*, 170.
Laursen, K., Masciarelli, F., & Prencipe, A. (2012). Regions matter: How localized social capital affects innovation and external knowledge acquisition. *Organization Science, 23*(1), 177–193. https://doi.org/10.1287/orsc.1110.0650
Laursen, K., & Salter, A. (2006). Open for innovation: The role of openness in explaining innovation performance among UK manufacturing firms. *Strategic Management Journal, 27*(2), 131–150. https://doi.org/10.1002/smj.507
Laursen, K., & Salter, A. J. (2014). The paradox of openness: Appropriability, external search and collaboration. *Research Policy, 43*(5), 867–878. https://doi.org/10.1016/j.respol.2013.10.004
Lepak, D. P., Smith, K. G., & Taylor, M. S. (2007). Value creation and value capture: A multilevel perspective. *Academy of Management Review, 32*(1), 180–194. https://doi.org/10.5465/amr.2007.23464011
Leten, B., Vanhaverbeke, W., Roijakkers, N., Clerix, A., & Van Helleputte, J. (2013). IP models to orchestrate innovation ecosystems: IMEC, a public research institute in nano-electronics. *California Management Review, 55*(4), 51–64. https://doi.org/10.1525/cmr.2013.55.4.51
Li-Ying, J., Mothe, C., & Nguyen, T. T. U. (2018). Linking forms of inbound open innovation to a driver-based typology of environmental innovation: Evidence from French manufacturing firms. *Technological Forecasting and Social Change, 135*, 51–63. https://doi.org/10.1016/j.techfore.2017.05.031
Losacker, S. (2022). 'License to green': Regional patent licensing networks and green technology diffusion in China. *Technological Forecasting and Social Change, 175*, Article 121336. https://doi.org/10.1016/j.techfore.2021.121336

Lv, D. D., Zeng, P., & Lan, H. (2018). Co-patent, financing constraints, and innovation in SMEs: An empirical analysis using market value panel data of listed firms. *Journal of Engineering and Technology Management - JET-M, 48*, 15–27. https://doi.org/10.1016/j.jengtecman.2018.02.001

Majchrzak, A., Bogers, M. L., Chesbrough, H., & Holgersson, M. (2023). Creating and capturing value from open innovation: Humans, firms, platforms, and ecosystems. *California Management Review, 00081256231158830*. https://doi.org/10.1177/00081256231158830

Manotungvorapun, N., & Gerdsri, N. (2016). Complementarity vs. compatibility: What really matters for partner selection in open innovation? *International Journal of Transitions and Innovation Systems, 5*(2), 122–139. https://doi.org/10.1504/IJTIS.2016.082063

McGahan, A. M., Bogers, M. L., Chesbrough, H. W., & Holgersson, M. (2021). Tackling societal challenges with open innovation. *California Management Review, 63*(2), 49–61. https://doi.org/10.1177/0008125620973713

de Melo, J. C. F., Salerno, M. S., Freitas, J. S., Bagno, R. B., & Brasil, V. C. (2021). Reprint of: From open innovation projects to open innovation project management capabilities: A process-based approach. *International Journal of Project Management, 39*(2), 170–182. https://doi.org/10.1016/j.ijproman.2021.01.003

Mele, C., & Russo-Spena, T. (2015). Innomediary agency and practices in shaping market innovation. *Industrial Marketing Management, 44*, 42–53. https://doi.org/10.1016/j.indmarman.2014.10.006

Milan, E., Ulrich, F., Faria, L. G., & Li-Ying, J. (2020). Exploring the impact of organisational, technological and relational contingencies on innovation speed in the light of open innovation. *Industry and Innovation, 27*(7), 804–836. https://doi.org/10.1080/13662716.2020.1754170

Miozzo, M., Desyllas, P., Lee, H. F., & Miles, I. (2016). Innovation collaboration and appropriability by knowledge-intensive business services firms. *Research Policy, 45*(7), 1337–1351. https://doi.org/10.1016/j.respol.2016.03.018

Moghaddam, E. N., Aliahmadi, A., Bagherzadeh, M., Markovic, S., Micevski, M., & Saghafi, F. (2023). Let me choose what I want: The influence of incentive choice flexibility on the quality of crowdsourcing solutions to innovation problems. *Technovation, 120*, Article 102679. https://doi.org/10.1016/j.technovation.2022.102679

Mongeon, P., & Paul-Hus, A. (2016). The journal coverage of Web of Science and Scopus: A comparative analysis. *Scientometrics, 106*(1), 213–228. https://doi.org/10.1007/s11192-015-1765-5

Montoro-Sánchez, A., Ortiz-de-Urbina-Criado, M., & Mora-Valentín, E. M. (2011). Effects of knowledge spillovers on innovation and collaboration in science and technology parks. *Journal of Knowledge Management*. https://doi.org/10.1108/13673271111179307

Morgan, L., & Finnegan, P. (2014). Beyond free software: An exploration of the business value of strategic open source. *Journal of Strategic Information Systems, 23*(3), 226–238. https://doi.org/10.1016/j.jsis.2014.07.001

Murgia, G. (2021). The impact of collaboration diversity and joint experience on the reiteration of university co-patents. *Journal of Technology Transfer, 46*(4), 1108–1143. https://doi.org/10.1007/s10961-018-9664-6

Nagle, F. (2018). Learning by contributing: Gaining competitive advantage through contribution to crowdsourced public goods. *Organization Science, 29*(4), 569–587. https://doi.org/10.1287/orsc.2018.1202

Napp, J. J., & Minshall, T. (2011). Corporate venture capital investments for enhancing innovation: Challenges and solutions. *Research-Technology Management, 54*(2), 27–36. https://doi.org/10.5437/08953608X5402004

Niesten, E., & Stefan, I. (2019). Embracing the paradox of interorganizational value co-creation–value capture: A literature review towards paradox resolution. *International Journal of Management Reviews, 21*(2), 231–255. https://doi.org/10.1111/ijmr.12196

O'Brien, I. M., Jarvis, W., & Soutar, G. N. (2015). Integrating social issues and customer engagement to drive loyalty in a service organisation. *Journal of Services Marketing*. https://doi.org/10.1108/JSM-02-2015-0085

Ogink, R. H., Goossen, M. C., Romme, A. G. L., & Akkermans, H. (2022). Mechanisms in open innovation: A review and synthesis of the literature. *Technovation, 102621*. https://doi.org/10.1016/j.technovation.2022.102621

de Oliveira, R. T., Verreynne, M.-L., Steen, J., & Indulska, M. (2021). Creating value by giving away: A typology of different innovation revealing strategies. *Journal of Business Research, 127*, 137–150. https://doi.org/10.1016/j.jbusres.2021.01.038

Ooms, W., & Piepenbrink, R. (2021). Open innovation for wicked problems: Using proximity to overcome barriers. *California Management Review, 63*(2), 62–100. https://doi.org/10.1177/0008125620968636

Ozmel, U., Yavuz, D., Reuer, J. J., & Zenger, T. (2017). Network prominence, bargaining power, and the allocation of value capturing rights in high-tech alliance contracts. *Organization Science, 28*(5), 947–964. https://doi.org/10.1287/orsc.2017.1147

Pedersen, S., Bogers, M. L., & Clausen, C. (2022). Navigating collaborative open innovation projects: Staging negotiations of actors' concerns. *Creativity and Innovation Management*. https://doi.org/10.1111/caim.12492

Piller, F. T., Roberts, D., Spedale, S., Chesbrough, H. W., Majchrzak, A., McCarthy, I., & Tucci, C. L. (2020). The need for a new narrative on value capture in open innovation environments. In *Proceedings of the academy of management annual meeting*.

Pisano, G. (2006). Profiting from innovation and the intellectual property revolution. *Research Policy, 35*(8), 1122–1130. https://doi.org/10.1016/j.respol.2006.09.008

Pisano, G. P., & Teece, D. J. (2007). How to capture value from innovation: Shaping intellectual property and industry architecture. *California Management Review, 50*(1), 278–296. https://doi.org/10.2307/41166428

Radziwon, A., Bogers, M., & Bilberg, A. (2017). Creating and capturing value in a regional innovation ecosystem: A study of how manufacturing SMEs develop collaborative solutions. *International Journal of Technology Management, 75*(1–4), 73–96. https://doi.org/10.1504/IJTM.2017.085694

Randhawa, K., West, J., Skellern, K., & Josserand, E. (2021). Evolving a value chain to an open innovation ecosystem: Cognitive engagement of stakeholders in customizing medical implants. *California Management Review, 63*(2), 101–134. https://doi.org/10.1177/0008125620974435

Reypens, C., Lievens, A., & Blazevic, V. (2016). Leveraging value in multi-stakeholder innovation networks: A process framework for value co-creation and capture. *Industrial Marketing Management, 56*, 40–50. https://doi.org/10.1016/j.indmarman.2016.03.005

Runge, S., Schwens, C., & Schulz, M. (2022). The invention performance implications of coopetition: How technological, geographical, and product market overlaps shape learning and competitive tension in R&D alliances. *Strategic Management Journal, 43*(2), 266–294. https://doi.org/10.1002/smj.3334

Sarpong, O., & Teirlinck, P. (2018). The influence of functional and geographical diversity in collaboration on product innovation performance in SMEs. *The Journal of Technology Transfer, 43*(6), 1667–1695. https://doi.org/10.1007/s10961-017-9582-z

Schäper, T., Jung, C., Foege, J. N., Bogers, M. L., Fainshmidt, S., & Nüesch, S. (2023). The S-shaped relationship between open innovation and financial performance: A longitudinal perspective using a novel text-based measure. *Research Policy, 52*(6), Article 104764. https://doi.org/10.1016/j.respol.2023.104764

Seo, R., & Park, J.-H. (2022). When is interorganizational learning beneficial for inbound open innovation of ventures? A contingent role of entrepreneurial orientation. *Technovation, 116*, Article 102514. https://doi.org/10.1016/j.technovation.2022.102514

Seran, T., & Bez, S. M. (2021). Open innovation's "Multiunit Back-End Problem": How corporations can overcome business unit rivalry. *California Management Review, 63*(2), 135–157. https://doi.org/10.1177/0008125620968609

Shaikh, M., & Levina, N. (2019). Selecting an open innovation community as an alliance partner: Looking for healthy communities and ecosystems. *Research Policy, 48*(8). https://doi.org/10.1016/j.respol.2019.03.011. Article 103766.

Shkolnykova, M., & Kudic, M. (2022). Who benefits from SMEs' radical innovations?—Empirical evidence from German biotechnology. *Small Business Economics, 58*(2), 1157–1185. https://doi.org/10.1007/s11187-021-00464-x

Simard, C., & West, J. (2006). Knowledge networks and the geographic locus of innovation. In H. W. Chesbrough, W. Vanhaverbeke, & J. West (Eds.), *Open innovation: Researching a new paradigm* (pp. 220–240). Oxford University Press.

Simonen, J., & McCann, P. (2008). Innovation, R&D cooperation and labor recruitment: Evidence from Finland. *Small Business Economics, 31*(2), 181–194. https://doi.org/10.1007/s11187-007-9089-3

Smith, W. K., & Lewis, M. W. (2011). Toward a theory of paradox: A dynamic equilibrium model of organizing. *Academy of Management Review, 36*(2), 381–403. https://doi.org/10.5465/amr.2009.0223

Solesvik, M., & Gulbrandsen, M. (2013). Partner selection for open innovation. *Technology Innovation Management Review, 3*(4), 6–11. https://doi.org/10.22215/timreview/674

Spender, J.-C., Corvello, V., Grimaldi, M., & Rippa, P. (2017). Startups and open innovation: A review of the literature. *European Journal of Innovation Management*. https://doi.org/10.1108/EJIM-12-2015-0131

Stefan, I., & Bengtsson, L. (2017). Unravelling appropriability mechanisms and openness depth effects on firm performance across stages in the innovation process. *Technological Forecasting and Social Change, 120*, 252–260. https://doi.org/10.1016/j.techfore.2017.03.014

Stefan, I., Hurmelinna-Laukkanen, P., & Vanhaverbeke, W. (2021). Trajectories towards balancing value creation and capture: Resolution paths and tension loops in open innovation projects. *International Journal of Project Management*. https://doi.org/10.1016/j.ijproman.2020.06.004

Stefan, I., Hurmelinna-Laukkanen, P., Vanhaverbeke, W., & Oikarinen, E.-L. (2022). The dark side of open innovation: Individual affective responses as hidden tolls of the paradox of openness. *Journal of Business Research, 138*, 360–373. https://doi.org/10.1016/j.jbusres.2021.09.028

Takahashi, S., & Takahashi, V. P. (2022). Analysis of front end dynamic in the value co-creation with multiple stakeholders. *International Journal of Managing Projects in Business(ahead-of-print)*.. https://doi.org/10.1108/IJMPB-11-2021-0301

Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy, 15*(6), 285–305. https://doi.org/10.1016/0048-7333(86)90027-2

Tojeiro-Rivero, D., & Moreno, R. (2019). Technological cooperation, R&D outsourcing, and innovation performance at the firm level: The role of the regional context. *Research Policy, 48*(7), 1798–1808. https://doi.org/10.1016/j.respol.2019.04.006

Toroslu, A., Herrmann, A. M., Chappin, M. M. H., Schemmann, B., & Castaldi, C. (2023). Open innovation in nascent ventures: Does openness influence the speed of reaching critical milestones? *Technovation, 124*, 102732. https://doi.org/10.1016/j.technovation.2023.102732

Torraco, R. J. (2005). Writing integrative literature reviews: Guidelines and examples. *Human Resource Development Review, 4*(3), 356–367. https://doi.org/10.1177/1534484305278283

Torraco, R. J. (2016). Writing integrative literature reviews: Using the past and present to explore the future. *Human Resource Development Review, 15*(4), 404–428. https://doi.org/10.1177/1534484316671606

Torres de Oliveira, R., Verreynne, M.-L., Figueira, S., Indulska, M., & Steen, J. (2022). How do institutional innovation systems affect open innovation? *Journal of Small Business Management, 60*(6), 1404–1448. https://doi.org/10.1080/00472778.2020.1775466

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. https://doi.org/10.1111/1467-8551.00375

Triguero, A., & Fernández, S. (2018). Determining the effects of open innovation: The role of knowledge and geographical spillovers. *Regional Studies, 52*(5), 632–644. https://doi.org/10.1080/00343404.2017.1395004

Vahter, P., Love, J. H., & Roper, S. (2014). Openness and innovation performance: Are small firms different? *Industry and Innovation, 21*(7–8), 553–573. https://doi.org/10.1080/13662716.2015.1012825

Wadhwa, A., Bodas Freitas, I. M., & Sarkar, M. (2017). The paradox of openness and value protection strategies: Effect of extramural R&D on innovative performance. *Organization Science, 28*(5), 873–893. https://doi.org/10.1287/orsc.2017.1145

Wang, B., & Li, Z. (2021). The relationship between non-pecuniary outbound openness and profit in large firms. *Technology Analysis & Strategic Management, 1-13*. https://doi.org/10.1080/09537325.2021.2011853

Wang, Z., & Jiang, Z. (2020). How R&D originality affects open innovation under knowledge spillovers? *European Journal of Innovation Management, 23*(4), 604–628. https://doi.org/10.1108/EJIM-12-2018-0276

Watson, R., Wilson, H. N., Smart, P., & Macdonald, E. K. (2018). Harnessing difference: A capability-based framework for stakeholder engagement in environmental innovation. *Journal of Product Innovation Management, 35*(2), 254–279. https://doi.org/10.1111/jpim.12394

West, J., & Bogers, M. (2014). Leveraging external sources of innovation: A review of research on open innovation. *Journal of Product Innovation Management, 31*(4), 814–831. https://doi.org/10.1111/jpim.12125

Williams, C., & Vossen, J. (2014). How open do MNCs need to be to extract value in open innovation? *International Journal of Innovation Management, 18*(5). https://doi.org/10.1142/S1363919614500352. Article 1450035.

Wu, Y. C., Lin, B. W., & Chen, C. J. (2013). How do internal openness and external openness affect innovation capabilities and firm performance? *IEEE Transactions on Engineering Management, 60*(4), 704–716. Article 6520890 https://doi.org/10.1109/TEM.2013.2262050.

Yan, Y., Dong, J. Q., & Faems, D. (2020). Not every coopetitor is the same: The impact of technological, market and geographical overlap with coopetitors on firms' breakthrough inventions. *Long Range Planning, 53*(1), Article 101873. https://doi.org/10.1016/j.lrp.2019.02.006

Zhang, D., Li, S., & Zheng, D. (2017). Knowledge search and open innovation performance in an emerging market: Moderating effects of government-enterprise relationship and market focus. *Management Decision*. https://doi.org/10.1108/MD-04-2016-0211

Zhang, J., Jiang, H., Wu, R., & Li, J. (2019). Reconciling the dilemma of knowledge sharing: A network pluralism framework of firms' R&D alliance network and innovation performance. *Journal of Management, 45*(7), 2635–2665. https://doi.org/10.1177/0149206318761575

Zhang, S., Xu, X., Wang, F., & Zhang, J. (2022). Can cooperation stimulate firms' eco-innovation? *Firm-level Evidence from China.*. https://doi.org/10.21203/rs.3.rs-1269079/v1

Zhang, X., Duan, K., Zhao, H., Zhao, Y., Wang, X., & de Pablos, P. O. (2020). Can cooperation drive the success of suppliers in B2B crowdsourcing innovation projects? A large scale data perspective. *Industrial Marketing Management, 90*, 570–580. https://doi.org/10.1016/j.indmarman.2019.09.011

Zynga, A., Diener, K., Ihl, C., Lüttgens, D., Piller, F., & Scherb, B. (2018). Making open innovation stick: A study of open innovation implementation in 756 global organizations. *Research-Technology Management, 61*(4), 16–25. https://doi.org/10.1080/08956308.2018.1471273