



Business network paradoxes: A literature review and co-evolutionary perspective

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ABSTRACT

How can studying paradoxes in business networks help understand the networks' adaptation and survival? IMP identifies three central paradoxes influencing business networks: *i*) Development of Relationships vs. Inability to Change, *ii*) Controlling vs. Effectiveness, and *iii*) Stability vs. Change. Studying them seems critical to knowing how interdependent participants in business networks adapt to one another. To do that, we use a co-evolutionary lens to review 41 articles dealing with business network paradoxes from an IMP perspective. Results of the Reflexive Thematic Analysis underline that salient tensions mainly originate from weak coordinating norms, resource misallocation, the relationship of newness and aging, and Machiavellian behaviour. As the main value of our work, we then advance that embracing a co-evolutionary perspective can help shed novel light on these paradoxes by contrasting the factors that make the tensions salient with those able to overcome them. Specifically, we identify moral behaviour, structuration of the network, network capability development, and co-adaptation as four main factors that mitigate the paradoxes and help networks' adaptation and survival. Accordingly, we advocate a co-evolutionary conceptual framework regarding paradoxes and outline five co-evolutionary claims as implications for research and practice.

1. Introduction

How can studying paradoxes in business networks help understand the networks' adaptation and survival? This review article addresses this pressing question, especially in the face of current sector challenges where organisations grapple with interdependent choices in their network relationships.

From a conceptual point of view, these paradoxes embody “contradictory yet interrelated elements, that may seem logical in isolation but appear absurd and irrational when considered simultaneously” (Lewis, 2000, p. 760). In other words, this concept introduces a balancing perspective that describes opposing dynamics at play (Håkansson & Ford, 2002).¹ The longstanding partnership between Ericsson and Telia, two major Swedish telecom players, is a well-known example (Håkansson & Ford, 2002) used to explain the concept of business network paradoxes. Their century-long collaboration birthed innovations like the 1920s automatic exchanges and pioneering mobile phones. Their joint AXE exchange project boosted Ericsson's global

prominence; however, the interplay of individual corporate strategies posed challenges and jointly formed both organisations. For instance, when Ericsson rolled out a new GSM system version, it had to accommodate several key players, with Telia being just one. Conversely, Telia had to ensure Ericsson's update meshed with releases from other vendors, like Nokia.

On this premise, the Industrial Marketing & Purchasing (IMP) Group has, over time, increasingly considered the study of paradoxes as beneficial to understanding the evolution of business networks. In particular, drawing on Håkansson and Ford (2002), Guercini and Tunisini (2017) recognises three core paradoxes influencing these networks: 1) companies may seek relationships, but relationships may also result in limiting their independence (*development of relationships vs. inability to change*); 2) companies may seek to control their network, but such control may also result inhibiting the innovation needed to ameliorate performance (*controlling vs. effectiveness*); 3) companies may seek network stability and change at the same time, as the latter may also foster new development opportunities (*stability vs. change*).

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¹ Paradoxes differ from pure contradictions in that they “create almost impossible choices, hence the seeming irrationality or absurdity” (Putnam, Fairhurst, & Banghart, 2016, p. 75).

The IMP approach to the study of business networks appears multi-*dyadic* yet paradoxical in its inner nature. In other words, the long-term interactions and pooled resources of interconnected actors are perceived to be the mortar that cements the network, creating a sense of solidity but, *at the same time*, locked-in positions (e.g., Anderson, Håkansson, & Johanson, 1994; Ford, 1984). In this regard, no works have reviewed the published literature on business network paradoxes, leaving space for duplications, inconsistencies, and deficiencies in how to face them for business network adaptation and survival. To fill this gap, our review work problematizes the three core business network paradoxes introduced above by systematically and thematically reviewing 41 articles published from an IMP perspective over time.

As a distinctive approach to the review, our analysis of these paradoxes is conducted by adopting a co-evolutionary lens (e.g., Breslin, Kask, Schlaile, & Abatecola, 2021), which, in the management literature, is to date well-accepted when studying organisation-environment and inter-organizational relationships (e.g., Murmann, 2013; Sandhu & Kulik, 2019). As one main value of our study, we argue that considering the logics and types of co-evolution can be helpful to shed novel light on these paradoxes. In particular, as the review demonstrates, the co-evolutionary perspective allows us to highlight factors (e.g., weak coordinating rules or resource misallocation) that make tensions salient, i.e., negative consequences that result from contradictory goals and interests between collaborating actors (Tura, Keränen, & Patala, 2019), and factors (e.g., network structuration or moral behaviour) able to overcome these tensions, leading to networks' adaptation and survival.

The remainder of this article is as follows: we first present the theoretical background, providing readers with a general conceptual introduction to the IMP perspective, paradoxes, and co-evolution. We then explain our review approach, specifying how we conducted a systematic thematic analyses. Results follow, focusing on how the three network paradoxes outlined above are associated with, and discussed in, the sampled IMP literature. As the main contribution of our review, we discuss our results proposing a co-evolutionary conceptual framework regarding paradoxes and tensions. Accordingly, we advance five claims about how co-evolutionary research in the future might further cross-fertilise the IMP perspective and refine the comprehension of paradoxes and tensions.

2. Theoretical background

2.1. IMP and paradoxes

The IMP literature roots go back more than four decades (Håkansson & Östberg, 1975), when the founding premise was a critique – based on empirical observations – of the mainstream economic theories' assumption about the supply-and-demand-based exchange, notably in tender markets.² Central to the IMP's ontological and epistemological disposition is its emphasis on the businesses' interconnected, interdependent, configurative nature, which inevitably rebuffs the perspective of companies as isolated entities (Andersen, Medlin, & Törnroos, 2020; Håkansson & Snehota, 1989). Within business networks, *nodes* can represent individual entities like organisations, serving as focal points for connections, while *threads* symbolize the relationships or interactions that connect these nodes, enabling communication and collaboration within networks. Notably, many business partnerships and inter-organizational networks involving interacting actors—firms and others—are rarely permanently cemented (Håkansson & Snehota, 1995; see also Golgeci, Karakas, & Tatoglu, 2019.). According to Håkansson and Ford (2002), this view already raises three key network paradoxes,

² Including rational economic behaviour, perfect competition, no barriers to change, no information asymmetry, etc., that the founding IMP scholars purposefully dismissed based on their empirical case study observations (Ford, 1984; Turnbull, Ford, & Cunningham, 1996).

meant as contradictions between interdependent elements that are not easily resolved but persist over time³:

- i) *Development of relationships versus inability to change*: An actor's relationships both enable and constrain its networking. From that, business networking involves deciding which facets of the relationship it is feasible to confront at a particular time and for which it is necessary to conform to the state of the art (Ford & Mouzas, 2013). Therefore, relationships form the cornerstone of a firm's operations and delineate the boundaries that can inhibit change. The paradox stems from how a node integrates into a network, with its formation directly tied to the presence of threads. Threads, formed through mutual investments, dictate a node's content richness. The overall network evolves through these investments, and both internal and external investments in threads shape a node's viability. While thread development offers benefits to nodes, it also imposes limitations. Strong threads, characterized by substantial content, enhance a node's vitality and restrict its flexibility to change (Håkansson & Ford, 2002).
- ii) *Controlling versus effectiveness*: Companies often strive to exert control over the network surrounding them, managing relationships to further their own objectives. This drive for *control* is a fundamental force shaping network dynamics. However, paradoxically, the more a company succeeds in controlling the network, the less *effective* and innovative it tends to become (Ford & Mouzas, 2013). Following Håkansson and Ford (2002), Within this network framework, each node is interconnected by threads, which play a crucial role in facilitating communication and collaboration between nodes. While each thread holds significance to its respective node, its true value lies in its contribution to the larger network structure. Threads serve as conduits for contact between nodes, each assuming a unique role depending on the nodes it connects. Moreover, the impact of any given thread on the nodes is influenced by the web of interdependencies with other threads. However, it is ultimately the nodes that govern these interconnections, shaping the overall network structure.
- iii) *Stability versus change*: While actors continually evolve their relationships, emphasizing the fluidity of network positions (Wilkinson & Young, 1994), this evolution is accompanied by inherent instability. Business networking involves an actor deciding when to *consolidate* within its existing pattern of relationships, derived through its previous interactions, and when to attempt to *create* a modified relationship pattern (Sutton-Brady, 2008). The relationships are in a cumulative flux, necessitating constant adaptation and recreation (Fonfara, Ratajczak-Mrozek, & Leszczynski, 2016). This fluidity and instability resonate with nodes and threads in networks, where nodes represent actors and threads symbolize the relationships between them. As actors make choices about their relationships, nodes and threads within the network constantly interact and evolve, shaping the overall network dynamics. Thus, the interconnectedness and interdependence of nodes and threads mirror the fluidity and instability inherent in business networking, emphasizing the need for constant adaptation and strategic decision-making.

To illustrate a paradox in a business network, consider the scenario of a software firm that actively involves its customers in co-creating new features for its flagship product. While this approach can lead to valuable insights and innovative solutions, it can also introduce paradoxical challenges to the firm-customer relationship. As customers become more deeply engaged in the development process, they might face conflicting

³ See also De Keyser, Guidette, and Vandenbempt, (2019) for an updated review.

expectations: the desire for personalised features tailored to their needs versus a standardised product that caters to a broader market. This tension between customisation and standardisation, inherent in the co-creation process, can create a paradoxical dynamic where increased customer involvement simultaneously enhances and strains the firm-customer relationship.

However, Gölgeci et al. (2019) contend that business network paradoxes do not work in silos; they deeply influence each other. Due to this increasing potential complexity, it seems relevant to make unnoticed or disregarded tensions in networks salient (Smith & Tushman, 2005) and identify the factors capable of overcoming them (Smith & Lewis, 2011). In our work, we tackle this goal, which has not yet been accomplished within the IMP literature. By researching the interconnected nature of business network paradoxes and examining how various factors interact to either exacerbate or alleviate tensions, we aim to shed light on overlooked dynamics within business networks and provide insights into managing these complexities.

2.2. Co-evolution

Putnam et al. (2016) emphasize the process-oriented systems perspective as a significant approach to understanding paradoxes in organisations. This perspective examines how contradictions within organisations change and develop over time. Within this perspective, scholars examine the *dialectical* nature of paradoxes, considering them not mere problems but inherent elements shaping organizational dynamics. Research adopting this perspective (see Benson, 1977), agree on three common assumptions: 1) organisations are in states of becoming, 2) they must deal with contradictory interests across multiple levels, and 3) they aim for or a balance between the push-pulls of opposing forces. Therefore, and mainly because of its constituting features explained below (e.g., Breslin et al., 2021), *co-evolution* seems to be a particularly appropriate theoretical lens for a review of the business network paradoxes.

In the current management literature (e.g., Sarta, Durand, & Vergne, 2021), co-evolution is generally referred to as a perspective that considers organizational adaptation as a two-way interaction process between organisations and their competitive environment (Lewin & Volberda, 1999; Murmann, 2013), with this process primarily based on interdependence and reciprocal feedback loops (Cafferata, 2016; Weber, 2017). In particular, the concept of co-evolution has its established origins in ecology, where it is widely used to explain the reciprocal evolution of two parties based on three fundamental, concurring principles (e.g., Abatecola, Breslin, & Kask, 2020; Janzen, 1980):

- a) *Specificity*. The actions of another party cause the evolution of a trait or character in one party. In business networks, specificity can be illustrated through the relationship between a software developer and a client. The client's specific requirements and requests (actions) directly influence the evolution of the developer's software-producing routines (characters).
- b) *Reciprocity*. Characters evolve in both parties as a result of the other. In business networks, reciprocity can be exemplified by the relationship between a manufacturer and a supplier. On the one hand, the manufacturer's preferences, like timely deliveries, product quality, and efficient communication, influence the evolution of favorable characters in the supplier, such as improved production processes, better quality control, and responsive customer service. On the other hand, the supplier's commitment to continuous improvement and innovation also shapes the manufacturer's practices and operations, creating a reciprocal evolution of characters in both actors.
- c) *Simultaneity*. Characters evolve in both parties in parallel. In business networks, simultaneity can be exemplified by the co-evolution of an electric vehicle manufacturer and an electricity supplier. As the manufacturer introduces models with enhanced battery technology

and longer ranges, the electricity supplier responds by developing and deploying more efficient and faster charging stations. In turn, the availability of fast-charging infrastructure influences the manufacturer's decision to invest in and produce vehicles with improved charging compatibility.

Also observed in industrial marketing management with a focus on companies (e.g., Breslin et al., 2021), business network relationships can be sorted into three types of co-evolutionary interactions (see also, e.g., Thompson, 1982, 2013, for ecological roots):

- a) *Antagonistic* co-evolution is when the relationship between two parties not in direct competition is conflictual and hostile; one actor attempts to eliminate the other, which, in turn, tries to avoid that. In business networks, this type of co-evolution can be likened to the interactions between a large mainstream-market incumbent (i.e., predator) and a small niche-market startup (i.e., prey), where the former seeks to acquire the latter to eliminate potential market threats and gain a new competitive edge. In response, the startup evolves defensive measures and re-positioning (e.g., through adopting innovative technologies, forming alliances, and implementing legal safeguards) to prevent a hostile takeover.
- b) *Competitive* co-evolution is when the two co-evolving parties compete directly for the same resource. In business networks, it might be two companies competing for a procurement contract or striving for dominance and customer attention, akin to lions and tigers fighting for the same food.
- c) *Mutualistic* co-evolution is when the interaction between the two co-evolving parties produces beneficial outcomes for both, such as bees and flowers. As illustrated above, business networks can be suppliers and manufacturers that co-create value propositions and spur each other's innovation routines, producing a competitive edge for both actors.

These three types of co-evolutionary relationships between related parties are theoretically distinct. At the same time, evolution scholars also prospect how one co-evolutionary relationship can change its type over time (e.g., Thompson, 1982, 2013). Turning this into an example from business practice, two automakers can shift from a competitive into a mutualistic co-evolutionary relationship. In the former, they compete for the same resource, for example, in terms of attracting the most appropriate (and exclusive) supplier to produce an engine; in the latter, they can cooperate to share the production of one specific component (e.g., the engine), for which the competition for attracting the supplier no longer holds.

Based on what has been explained, the (co-)evolutionary perspective parallels IMP research. Both approaches share foundational tenets, such as ontological commitments to interdependent entities, systems thinking, and configurative aspects of relationships and resources (Brennan, 2006). Both perspectives advocate for understanding relationships and networks as adaptive, multi-dependent, path-dependent, and cumulatively evolving entities shaped by the two-way causation of focal sub-systems (e.g., organisations) and the larger systems (e.g., networks) they are part of. This common ground allows for a complementary and meaningfully transferable understanding of dynamism, change, and stability in parties' interactions. To illustrate this, the IMP's network paradoxes emphasize the reciprocal influence between the focal organisation and its network (Håkansson & Ford, 2002), where a focal sub-system both controls and is controlled by the larger system, closely aligns with the guiding principle of a layered ontology in an open, adaptive system with emergent properties in the (co-) evolutionary approach (Hodgson & Knudsen, 2010). This postulates that each party in the network is involved in shaping the network, while the network simultaneously shapes the evolution of its sub-systems (Campbell, 1974).

The rationale for this work is that the shared ontological

commitments provide opportunities for the explanatory logic of a co-evolutionary framework to be transferred and that they add novel explanatory power to the IMP research about network paradoxes, which, in turn, can help to understand the networks' adaptation and survival.

3. Methods

Challenging taken-for-granted assumptions, identifying/exposing contradictions/paradoxes in the established literature, and tackling them from a different theoretical perspective, is a solid way to theorise through reviews (Breslin & Gatrell, 2020). This is why we conceived this article as a systematic literature review on IMP paradoxes adopting a co-evolutionary approach. Our review has been structured in two main steps as follows (see Fig. 1):

1. *Literature Search and Selection.* The literature search used the following databases: EBSCO, ProQuest's ABI/Inform, ISI Web of Science, and Scopus. It was not temporally limited and occurred in July 2022; articles published after that date are not included. Following the search strategy of Aramo-Immonen et al. (2020), who made a bibliometric analysis of the IMP literature, we focused on the exact keywords: "IMP," or "industrial marketing*," or

"business*interaction*" or "interfirm*" or "interorg*" to ensure that the research was set in the IMP field. In total, 2712 documents were found. The raw list was then first shortened to only articles published in marketing journals (according to the ABS list) or in the *Journal of Business Research*, which has long been considered a central journal for IMP scholars (Aramo-Immonen et al., 2020, did the same). This was done to exclude: a) works that use the exact keywords but with a non-IMP denotation, and b) works written by IMP scholars not building on the IMP perspective in the specific publications. Consequently, the substantive relevance of the contributions concerning the aim of this work was ensured by requiring that the selected abstracts contained at least one of the following words: "network*" or "constellation*" or "chain*" or "allianc*." 1007 results were produced. After duplicates from databases were eliminated, 173 results remained.

2. *Literature Synthesis and Analysis.* First, full texts of the articles were scanned to ensure that their content focused on IMP and the theme of networks; 92 articles were still in the sample. Full texts of the included articles were then read to ensure their alignment with the research objective, including articles that directly or indirectly addressed the following paradoxes: 1) operational and developmental benefits coming from companies' relationships vs. inability to

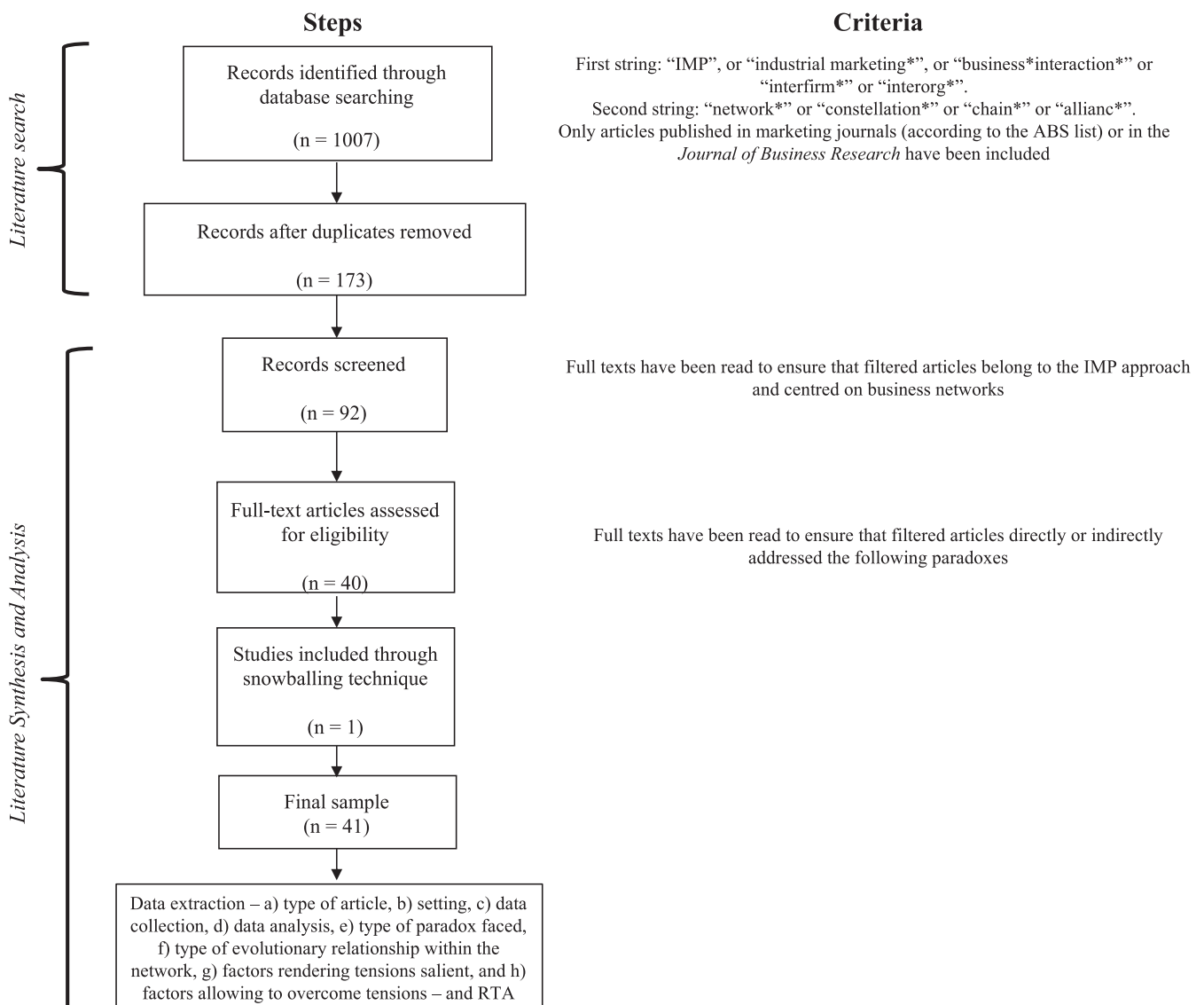


Fig. 1. Flowchart of the adopted systematic literature review method.

change; 2) ambitions in controlling the network vs. effectiveness/innovativeness of the network; 3) stability vs. change in a network. Initially, two authors individually read the articles and then compared their evaluation; when disagreeing, they assessed the papers and decided to include (or not) them within the sample. A sample of 40 papers came out from this step. The snowballing technique was then applied to the reference list, and one article was added. For this last search step, similar to Soto-Simeone, Sirén, and Antretter (2020), we also performed manual search and citation tracking, i.e., backward search (Webster & Watson, 2002), which consists of reviewing the references of the articles yielded from the keyword search. In addition, we examined additional sources that have cited the set of articles, i.e., forward search (Webster & Watson, 2002), previously derived from keyword and backward search. This implementation, needed to mitigate the incomplete coverage bias of systematic literature reviews, led to one article being added to our dataset, with our final sample of 41 publications.

For each paper in the sample, we coded the following: a) type of article, b) setting, c) data collection, d) data analysis, e) type of paradox faced, f) type of co-evolutionary relationship within the network, g) factors rendering tensions salient, and h) factors allowing to overcome tensions (see Table 1).

To code the type of co-evolutionary relationship within the network, the factors rendering tensions salient, and the factors allowing to overcome tensions, we followed a Reflexive Thematic Analysis (RTA) approach (Braun & Clarke, 2019), composed of six steps: 1) familiarising yourself with your data, 2) generating initial codes (deductively, inductively, or in a mixed way), 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the report. Deductively adopted codes for the type of co-evolutionary relationship within the network were “antagonistic”, “competitive”, and “mutualistic”, as explained in our theoretical framework. Regarding coding factors that render tensions salient and allow business networks to overcome them, we adopted an inductive approach. Codes were then grouped according to the authors' scientific knowledge and interpretation. Altogether, codes and articles – respectively quantified in terms of the number of appearances in each transcript and related attachments and according to the sum of codes' frequencies pointing to them – allowed the construction of the co-evolutionary view of business network paradoxes in IMP research (as presented in our Discussion section).

4. Results

4.1. Descriptive statistics

Here, we present some descriptive statistics regarding the sample papers. Regarding year distribution, 19 (46%) have been published in the last five years (2017–2022), with an overall increasing trend. Among them, Sweden is the leading country of origin of the contributors (19% out of the total papers).

Half of the papers have been published in *Industrial Marketing Management*, a referencing outlet for IMP scholars. Among the 41 contributions, 28 (68%) were empirical qualitative, with a prevalence of longitudinal case studies based on interviews and secondary data, usually followed by historical narrative analyses. Only two (5%) empirical quantitative articles are in the sample, while the remaining works (11; 27%) are conceptual. *Stability vs. change* was the main investigated paradox (17; 41%), followed by the *development of relationships vs. inability to change* (15; 37%) and *controlling vs. effectiveness* (9; 22%). Most contributions (80%) framed the co-evolutionary relationship of business actors as mutualistic.

Table 2 and Table 3 show the results of the RTA and provide the definitions for the emerging themes. Among the factors that make tensions salient, we identified 15 codes. The most found have been the

“solid routinised relationship” (n. 10; 17% of the total) and “resource identification” (n. 7; 12% of the total), distributed among four themes: 1) weak coordinating rules (the most frequent; 42%), i.e., the lack of dynamic standards, rules, and schedules that comprise coordinating mechanisms among actors in the business network; 2) resource misallocation, i.e., the misallocation of resources, meaning assets which are semi-permanently tied to the network, among business actors in the network; 3) relationship of newness and aging, i.e., the lack of deterioration of the relationships among business actors in a network due to its newness or aging; and 4) Machiavellian behaviour, i.e., behaviour featured by an avowed belief in the effectiveness of manipulative tactics in dealing with other actors, a cynical view of business actors, and a moral outlook that puts expediency above principle.

Regarding the factors able to overcome salient tensions based on paradoxes in business networks, we identified 15 codes, too. The most found have been the “adapting aspirational levels” (n. 18; 19% of the total) and “harmonising resources and capabilities” (n. 16; 17% of the total), distributed among four themes: 1) network capability development, i.e., the development of a network's ability to develop and utilise inter-organizational relationships to allow access to various resources held by different actors in the; 2) co-adaptation, i.e., mutual changes among connected firms over time; 3) structuration of the business network, i.e., defining and formalizing rules, boundaries, and types of collaboration at the basis of a business network; and 4) moral behaviour, i.e., evaluating and interpreting the moral side of the situation, formulating the moral ideal and choose a course of action that corresponds to moral values. Network capability development and co-adaptation have been the most frequent themes (37% each).

4.2. Paradox 1: Development of relationships vs. inability to change

The first paradox reviewed centres on the contrast between the actors' urge and capacity to develop and alter business ties with other network members and the constraints posed by interdependencies and lock-ins. In the traditional IMP literature (e.g., Håkansson & Snehota, 1995), activity links, resource ties, and actor bonds are the elements subject to change in business relationships and further into the whole network. These (active and passive) adaptations can either be seen as the re-bundling of resources and activities within existing ties or as the exchange of links to tailor the network to changing demands. It is important to note that within the IMP perspective, the concept is that networks inherently lack fixed boundaries, which aligns with the perspective that each researcher or manager might perceive these boundaries differently.

Beginning with the paradox, it is evident that the openness of the network structure and its relational embeddedness form the foundation of network evolution. This systemic view helps us understand the adaptation of the individual organisation. This interpretation aligns well with IMP's core assumption that business is done in networks of interdependent actors. The different interconnections that new players generate at multiple levels can increase the chances of restructuring existing industries by disrupting their old structure (e.g., Keränen, Komulainen, Lehtimäki, & Ulkuniemi, 2021). This is the case, for example, of joint lobbying activities by network actors toward, for instance, political institutions and policymakers. However, the relationship between collaborating entities and policymakers is also coevolving as the network is influenced by, for example, politics and consumer demand.

However, more embeddedness or openness in the network can benefit from restricting change or having a network that continuously experiences changes. This is a paradox and dilemma for the network actors. By adopting the co-evolutionary approach, we advance that embeddedness and openness are instrumental to producing new knowledge flows and problem-solving tasks within the business network. These latter are two pivotal activities for the self-organisation of the business network but have been deeply investigated in IMP in

Table 1
a sub-sample of selected and analyzed articles.

#	Authors	Year	Setting	Type of paradox	Type of evolutionary relationship	Factors rendering contradictions salient (example of the coded text)	Factors rendering contradictions salient (code)	Factors rendering contradictions salient (theme)	Adapting factors able to overcome contradictions (example of the coded text)	Adapting factors able to overcome contradictions (code)	Adapting factors able to overcome contradictions (theme)
1	McGrath, H.; O’ Toole, T.	2021	24 new ventures in the micro-brewing industry in Ireland, Belgium and the USA	Stability Vs. Change	Mutualistic	“Hence, these new ventures have to work hard to gain acceptance, position and identity within an evolving network, as it requires others to change to accommodate them” (p. 1601)	Lack or reputation	Stable ties liability	“Early stage new venture engagement strategies are the initial experimental postures new ventures use to activate their business-to-business networks” (p. 1600) “Our findings suggest five early stage engagement strategies that entrepreneurial firms use to gain traction in interaction” (p. 1604), i.e. B2B network prospecting, Co-branding/Co-promoting, Maker-mindset to adapting, SM platforming, Recognition and activation of network role	Professionalization of the network; Networked type based-collaboration	Structuration of the network; Network capability development
2	Guercini, S; Tunisini, A	2017	15 cases of network contracts	Development Vs. Inability to change	Mutualistic	“Formalization in business networks can thus perform various functions that enhance and support interaction and value creation among participants. Such functions include increasing predictability, enhancing trust and protecting knowledge. However, it has also been recognized that formalization can generate problems due to the burdens stemming from routinisation that can limit the flexibility necessary to face high uncertainty and stifle the creative and innovative	Solid routinized relationship	Relationship liability of newnwss or aging	“Formalization through NC performs useful functions not only for the parties to the contract, but for others as well. Clearly, for the parties to an NC, formalization can have effects on the conditions of power and trust, it can reduce ambiguity and support conditions favorable to developing fragile trust” (p. 104).	Regulative framework for networks	Structuration of the network

(continued on next page)

Table 1 (continued)

#	Authors	Year	Setting	Type of paradox	Type of evolutionary relationship	Factors rendering contradictions salient (example of the coded text)	Factors rendering contradictions salient (code)	Factors rendering contradictions salient (theme)	Adapting factors able to overcome contradictions (example of the coded text)	Adapting factors able to overcome contradictions (code)	Adapting factors able to overcome contradictions (theme)
3	Aarikka-Stenroos, L.; Sandberg, B.	2012	Two cases on Finnish commercialization networks: Nordic Walkers (poles for fitness walking) and the Bone Health Exercise Monitor (a device for monitoring bone exercise)	Stability Vs. Change	Competitive-Mutualistic	potential of interaction and networking” (p. 95) “Resources needed for trust creation, credibility establishment, awareness building, customer education, trial opportunities, distribution, and complementary offerings” (p. 200). “Newtest, on the other hand, aimed at radical network change through the integration of diverse, unfamiliar actors on the basis of a common value-creating issue. The company managed to form relations with some local actors with which it had prior social relations, but failed to do so with global actors, the most advantageous ones seeing no value in this new cross-industry networking. As new relations did not rest on previous organizational or social relations, and the benefits of cooperation were not clear, only a few radical dyadic changes emerged and no radical network change occurred” (p. 202)	Resource collection; solid routinized relationship; luck of trust	Resource allocation; relationship liability of newnwss or aging	“Thus, in the case of Nordic Walkers, the main actors were committed, they trusted each other, and they were willing to share relations while they all benefited from the success of the innovation” (p. 204) “Dissimilarity may also be a predictor of success: weak ties with dissimilar actors bring in new and different insights and innovation potential” (p. 201) “The utilization of established existing relations facilitated the transition from the R&D to the commercialization network which expanded as the need for new kinds of resources emerged” (p. 204). “The innovating firm needs particular commercialization competence in terms of: • access resources for the commercialization through social relations and trust building • mobilise resources for the commercialization through motivating and providing resource trade-offs • organize resources for the commercialization and accommodate interconnectedness, reciprocity, and goal coherence” (p. 205)	Harmonizing resources and capabilities; Adapting aspirational levels; Networked type based-collaboration	Network capability development; Co-adaptation
4	Crick, J.M.; Crick, D.	2021	323 American wine producers	Stability Vs. Change	Competitive-Mutualistic	“However, since competitive intensity was found	Competitive intensity	Environmental forces	“A cooperation-oriented mindset, a competitor orientation, inter-firm	Adapting aspirational levels; mutual help; inter-firm trust;	Co-adaptation; Conscientious behaviour

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Table 1 (continued)

#	Authors	Year	Setting	Type of paradox	Type of evolutionary relationship	Factors rendering contradictions salient (example of the coded text)	Factors rendering contradictions salient (code)	Factors rendering contradictions salient (theme)	Adapting factors able to overcome contradictions (example of the coded text)	Adapting factors able to overcome contradictions (code)	Adapting factors able to overcome contradictions (theme)
						to negatively moderate the relationship between inter-firm trust and coopetition activities (supporting H7), there is new evidence pertaining to how market-level factors can distort the somewhat fragile coopetition paradox if not managed effectively. This result builds upon earlier research that indicated how these paradoxical forces can be unhinged by excessive rivalry and can prevent effective forms of coopetition from being implemented” (p. 80)			trust, and competitive intensity had linear (positive) and significant associations - supporting H1, H2, H3, and H4. They highlight their respective roles as key constructs that can help facilitate the implementation of coopetition strategies. Specifically, for coopetition to exist, managers and functional-level employees should believe in the importance of cooperating with their competitors (a coopetition- oriented mindset). They should also possess market intelligence pertaining to their rivals' strengths and weaknesses (a competitor orientation). Likewise, they are best-served if they have confidence and faith in certain competitors (inter-firm trust). Furthermore, there needs to be a certain degree of rivalry within a market (competitive intensity) to enable decision-makers to select appropriate competitors to collaborate with” (p. 80)		
5	Eriksson, V.; Hulthen, K.; Pedersen, A.C.	2021	A business triad composed of a wholesaler of installation products, one of its main customers, and a transport service provider	Development of relationships Vs. Inability to change	Mutualistic	change in the network horizon of one firm may create ripple effects in the network and, as a consequence, necessitate further changes in the network horizons of other firms. As such,	Heterogeneity of business relationships, company features, horizons; resource collection	Coordinating rules; Resource allocation	As shown here, interaction among the involved actors is a key issue to create awareness and expand its own as well as others' network horizons to be able to define the relevant part for a certain change. In conclusion, when	Adapting aspirational levels	Network capability development; Co-adaptation

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Table 1 (continued)

#	Authors	Year	Setting	Type of paradox	Type of evolutionary relationship	Factors rendering contradictions salient (example of the coded text)	Factors rendering contradictions salient (code)	Factors rendering contradictions salient (theme)	Adapting factors able to overcome contradictions (example of the coded text)	Adapting factors able to overcome contradictions (code)	Adapting factors able to overcome contradictions (theme)
6	Fonfara, K.; Ratajczak-Mrozek, M.; Leszczynski, G.	2016	–	Development of relationships Vs. Inability to change	Mutualistic	it is difficult to manage the network horizon because each firm is connected to other firms and embedded in the broader network. We also know that firms tend to be unaware of their network horizons because of lack of resources.	Heterogeneity of business relationships, company features, horizons; interdependency	Coordinating rules	firms face a change initiative, the network horizon is of utmost importance; it is up to the managers to act upon what they perceive, and by that create their expectations of the future. Nevertheless, to act upon what they perceive requires knowledge about how their network horizon overlaps, partly overlaps and does not overlap with other actors' network horizons. "An organisation's adaptation skills are directly linked to its flexibility and require a firm to define its ability to initiate, react to and implement change with respect to specific relationships as well as to the whole business network. The assumption of interdependence among entities necessitates that an organisation needs to be flexible. This flexibility is a necessary condition for reacting to the needs of actors with whom relationships are established as well as to reacting to changes driven by other actors within the business network" (p. 188)	Adapting aspirational levels; dynamic relationship capability	Co-adaptation; Network capability development
7	Ford, D.; Mouzas, S.	2013	Procter&Gamble development of business networking	Development of relationships Vs. Inability to change	Mutualistic	"The first network paradox: an actor's relationships both enable and constrain its networking: Any attempt by an actor to achieve change within a relationship	Dependency/ Interdependency; solid routinized relationship; Resource collection; Information/ knowledge asymmetry	Resource allocation; Relationship liability of newness or aging; Coordinating rules	"Successful networking by the actors in any one relationship depends on their effective networking in other relationships. A business network is an arena in which interdependent actors relate to each	Relationship opportunity exploration; Dynamic capabilities; Capitalize on diversity; Collective problem solving	Network capability development; Co-adaptation; Moral behaviour

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#	Authors	Year	Setting	Type of paradox	Type of evolutionary relationship	Factors rendering contradictions salient (example of the coded text)	Factors rendering contradictions salient (code)	Factors rendering contradictions salient (theme)	Adapting factors able to overcome contradictions (example of the coded text)	Adapting factors able to overcome contradictions (code)	Adapting factors able to overcome contradictions (theme)
8	Ramaswamy, V.; Ozcan, K.	2020	–	Development of relationships Vs. Inability to change; Controlling Vs. Effectiveness	Mutualistic	depends on the resources, activities and attitudes of its counterpart. Thus, business networking within relationship involves choices about which aspects of the relationship it is feasible to confront at a particular point in time and for which it is necessary to conform to the status quo” (p. 437)	Independent goals; dependency/interdependency	Coordinating rules	other in unique ways and a business network accommodates a wide diversity of practice and structure within and between actors. Any attempt to understand this interacted landscape has to allow for its diversity and any attempt to operate within it has to accommodate and capitalize on its diversity. Successful networking depends on an awareness of the shifting positions in network time and space of participating actors, an awareness of the respective network pictures of counterparts, a clear view of the alternatives for all actors and a realistic time horizon. Hat skills in networking are likely to be built as much on scanning, flexibility, adaptation and learning from and following others as they are on individual strategies or long-term planning” (p. 440)	Introducing stabilizing and destabilizing network routines; adapting aspirational levels	Structuration of the network; Co-adaptation

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9	Hakansson, H.; Waluszewski, A.	2018	–	Stability Vs. Change	Competitive-Mutualistic	stakeholders that have a 'stake' in co-created outcomes" (p. 1173) "The paradox is that the heavier the resource constellations, the more efficient they will be in relation to some related actors, and some related places and spaces, while it will be less efficient for others. Consequently, heaviness implies that certain development paths will be less attractive – and/or definitely costly – compared to suggestions that are less radical" (p. 262)	Dispersion of key resources	Resource allocation	"To be efficient, the resources involved must add to other related resources, internal as well as external. In order to adapt to and take advantage of these heavy resource constellations, interactions and relationships to the actors representing these had to be established. This made certain interactions and relationships more economically heavy from the involved actors' point of view. In order to change or to establish a new economic exchange interface, there is an urgent need to be aware of and utilise heaviness, to find out in what way existing investments made in related interfaces can be taken advantage of. In order to do that, there is a need for a better understanding of the function of heaviness, spatial and journey aspects included" (p. 262)	Harmonizing resources and capabilities	Network capability development
10	Rubach, S.; Hoholm, T.; Hakansson, H.	2017	Four successive regional innovation projects in Norway	Stability Vs. Change	Competitive-Mutualistic	"Every business network already has a number of heavy development processes taking place within its interactions. These are built on existing resources and performed activities. In order to achieve something else – an	Solid routinized relationship; Sunk costs	Relationship liability of newness or aging; Resource allocation	"Moreover, the knowledge base within industrial networks is distributed among the activity patterns and related resources of multiple actors, and closely related to the situated content of those activities. Thus the utilization of networked knowledge in regional	Dynamic relationship capability; Networked type based-collaboration; Introducing stabilizing and destabilizing network routines; Public support for innovation	Structuration of the network; Network capability development; Co-adaptation

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Table 1 (continued)

#	Authors	Year	Setting	Type of paradox	Type of evolutionary relationship	Factors rendering contradictions salient (example of the coded text)	Factors rendering contradictions salient (code)	Factors rendering contradictions salient (theme)	Adapting factors able to overcome contradictions (code)	Adapting factors able to overcome contradictions (theme)
					innovation that is not a consequence of the existing interactions – there is a need to disrupt what is already happening, and at the same time mobilise support for the ‘new’ element from the existing actors” (p. 179)	innovation requires a delicate balance between the challenging of established practices and the introduction of novel innovation network initiatives. At the same time it must be recognized that the value of knowledge can be measured against its relevance and its relationship to some or all of the established network” (p. 201)				

Note: the full dataset, available upon request, has not been inserted only for space reasons.

Table 2

Factors that make tensions salient, at the basis of paradoxes in business networks.

Code	No.	%	Theme (%) and definition
Heterogeneity of business relationships, company features, horizons	6	24%	Weak coordinating rules (42%): The lack of dynamic standards, rules, and schedules that comprise coordinating mechanisms (Jarzabkowski et al., 2012) among actors in the business network
Independent goals	5	20%	
Complexity in coordination	5	20%	
Lack of normative commitments	5	20%	
Industry rules	2	8%	
Lack of boundaries	1	4%	
Centralization of decisions	1	4%	
Total	25	100%	
Resource identification	7	54%	Resource misallocation (22%): The misallocation of resources, i.e., assets which are semi-permanently tied to the network, among business actors in the network (e. g., Maritan and Lee, 2017)
Sunk costs	4	31%	
Dispersion of key resources	2	15%	
Total	13	100%	
Solid routinized relationship	10	83%	Relationship liability of newness and aging (20%): The lack of deterioration of the relationships among business actors in a network due to its newness or aging (e.g., Abatecola, Cafferata, & Poggesi, 2012)
Lack or reputation	2	17%	
Total	12	100%	
Opportunistic attitude	5	50%	Machiavellism behaviour (16%): Behaviour featured by an avowed belief in the effectiveness of manipulative tactics in dealing with other actors, a cynical view of business actors, and a moral outlook that puts expediency above principle (O’Boyle et al., 2012)
Information asymmetry	3	30%	
Lack of transparency	2	20%	
Total	10	100%	
TOTAL No. of codes	60		

Note: the % of a theme is calculated as the No. of codes belonging to a theme divided by the total number of codes.

recent times. The entrance of new players into a business network can increase actors' learning about their needs and counterparts' resources. The closer to each other, the more integrated the business actors and the pooled resources are. From that, increasing the network knowledge should be the aim of interaction rules because it is thanks to them that actors become more complementary and heterogeneous resources fit together (Janusz, Bednarek, Komarowski, Boniecki, & Engelseth, 2018). From that, despite too much embeddedness and openness seeming to lead the business network to situations in which it is difficult to change, or chance is the “praxis,” we advance that these bring to new self-caused states of equilibrium.

Second, the lack of universally accepted network borders makes network adaptation challenging to quantify, as researchers may need to find out if it is within or beyond the focal network. Guercini and Medlin (2020; p. 511) define boundaries as “interaction areas and periods where distinctions are generated, maintained, and modified.” This constructivist approach to business network boundaries is similar to co-evolution, excluding unidirectional, non-reciprocal connections from the focal ecosystem (Phillips & Ritala, 2019). Network participants who do not meet the conditions of reciprocity, simultaneity, and specificity could be excluded from the defined business network and considered part of the interacting environment beyond. To consider corporate networks co-evolutionary, we should only include coevolving relationships (Breslin et al., 2021).

In the IMP literature sampled, there is a pronounced emphasis on the co-evolutionary dynamics inherent in business network interactions. Studies, such as that of Keränen et al. (2021), underscore the importance of bidirectional links at multiple levels, ranging from individual firms to the broader network and macro levels. Reciprocal change (e.g., adaptation) within focal nets and business ties across the network is central to this co-evolution, with innovation serving as a focal catalyst, driving

Table 3

Factors able to overcome salient tensions at the basis of paradoxes in business networks.

Code	No.	%	Theme (%) and definition
Harmonizing resources and capabilities	16	46%	Network capability development (37%) The development of a network's ability to develop and utilise inter-organizational relationships to allow access to various resources held by different actors in the network (e.g., McGrath and O'Toole, 2014)
Dynamic relationship capability (sensing, seizing, transforming the relationship)	14	40%	
Collective problem solving	5	14%	
<i>Total</i>	35	100%	
Adapting aspirational levels	18	50%	Co-adaptation (37%) Mutual changes among connected firms over time (Breslin et al., 2021)
Networked type based-collaboration	9	25%	
Relational embeddedness	6	17%	
Knowledge exchange	3	8%	
<i>Total</i>	36	100%	
Regulative framework for networks	5	33%	Structuration of the business network (16%) Defining and formalizing rules, boundaries, and types of collaboration at the basis of a business network (e.g., Guercini & Tunisini, 2017)
Professionalization of the network	4	27%	
Introducing stabilizing and destabilizing network routines	3	20%	
Public support to innovation	3	20%	
<i>Total</i>	15	100%	
Inter-firm trust	4	40%	Moral behaviour (10%) Evaluating and interpreting the moral side of the situation, formulating the moral ideal and choose a course of action that corresponds to moral values (Tangney et al., 2007)
Mutual help	2	20%	
Transparency in communication	2	20%	
Capitalize on diversity	2	20%	
<i>Total</i>	10	100%	
TOTAL No. of codes	96		

Note: the % of a theme is calculated as the No. of codes belonging to a theme divided by the total number of codes.

variation creation that elicits reciprocal reactions. This symbiotic dance of variation and response, or co-evolution, manifests in network members' choices. As Andersson, Dubois, Eriksson, Hulthén, and Holma (2019) articulate, fostering mutualism and innovative variation among actors is critical for operational adaptation, particularly given the interdependencies in sectors such as transportation. Along the same lines, Guercini and Runfola (2012) provide insight into the relationship alternatives that network-embedded businesses face: they can either deepen integration with existing ties, resulting in network consolidation or opt for network innovation, resulting in variation and evolution.

In summary, navigating the paradox of relationship development versus the inability to change reveals what guides, fosters, and hinders business network evolution. The delicate interplay in this tension opens avenues for studying the thresholds of embeddedness and when they turn from advantageous to restrictive. Such a focus could uncover strategies for business actors to better navigate and recalibrate within networks. Additionally, the bidirectional dynamics and co-evolution discussed (although often in other terms) in the IMP literature hint at a potential area of research into how these interactions shape network evolution over extended periods. By a more thorough exploration of the relationship dynamism, IMP research can provide more actionable insights for business actors aiming to improve their operations in (co-)evolving networks.

4.3. Paradox 2: Controlling vs. effectiveness

Stemming from the fact that “complex adaptive systems emerge through the interactions of ecosystem members, and rules define these interactions” (Breslin et al., 2021; p. 62), it is pivotal to identify the corresponding rules that govern business networks according to the reviewed IMP work. While mutualistic behaviour emerged as the most

diffused type of interaction in the sample, other types also appeared. As for the network of a micro-brewery industry, a new entrance can happen through different mutualistic strategies (e.g., through co-promotion or joint ventures), by which more minor actors join forces to tackle larger competitors (McGrath & O'Toole, 2021). However, other works have looked at business networks formed by co-evolving relationships, whose orientation and strength vary based on the time and degree of interdependence among business actors. This is exemplified in supplier-buyer relationships in e-commerce, where suppliers can fall out of favour if they resist adapting to new technological requirements (Boeck, Bendavid, & Lefebvre, 2009).

The changing relationship and adaptation dynamics become most evident in their underlying competition logic. According to Leite, Pahlberg, and Åberg (2018), firms switch between cooperation and competition. These two logics may coexist in actor relationships but are mutually exclusive regarding a specific shared activity. Exploration mandates cooperative behaviour, while exploitation leans toward competition. This vacillation between competition and cooperation highlights the second paradox: the tension between controlling relationships (through formal structures like contracts) and achieving effectiveness (through fluid, cooperative strategies that may not always be formalised). For relationships to transition smoothly between competitive and cooperative logic, connected actors must be symmetric and interdependent, ensuring the benefits of the link surpass conflicts and opportunism. This balance ensures survival during intense competition periods. Framed as co-competitive, these interactions contradict the co-evolutionary lens because “cooperation and competition cannot happen in the same activity, at the same time, for the same project” (Leite et al., 2018; p. 503). Pure competitive and cooperative relationships can be seen as “simultaneous,” as advanced by co-evolution. Still, co-competition cannot be the case because a temporal lag is needed to shift from the cooperative to the competitive relationship. However, this co-competition may not always benefit business networks. Ambiguities in identifying competitors and co-operators can stifle joint activities, even if they are crucial for ongoing business (Aarikka-Stenroos & Sandberg, 2012).

It is essential to distinguish between formal/contractual and informal/tacit relationships and between antagonistic, competitive, and mutualistic interactions. Formal relationships codify links concerning objectives, strategies, and behaviours, promoting coordination and legitimacy. In contrast, informal ones revolve around daily exchanges. In this regard, Guercini and Tunisini (2017) explain how formalizing networks could reduce ambiguity, foster “fragile trust” and help policymakers identify firms' aggregations so they can be the target of specific industrial policies. However, central parts of the IMP literature (Ford, Gadde, Håkansson, & Snehota, 2011; Freytag & Ritter, 2005; Håkansson & Ford, 2002) suggest that formal contracts might suppress innovation diffusion. Relating to the second paradox, while formalization (control) offers stability and predictability, it might come at the cost of effectiveness and creativity, significantly when it hampers innovation. From a co-evolutionary standpoint, formal, long-term relationships bolster system stability and partner positioning. In this situation, network alterations primarily occur when boundaries are breached, which should be rare in a stable network (Li, Yang, Sun, Ji, & Feng, 2010).

In conclusion, the paradox of control and effectiveness offers an imperative to explore the temporal dynamics of competition, cooperation, and “co-competition”, probing how firms can fluidly transition between different types of inter-firm co-evolution. Moreover, the balance between contractual rigidity and innovation-friendly environments remains, to some extent, an underexplored stream in the IMP body of knowledge. Future IMP studies should thus focus on operationalising these balances, opening doors to novel strategies that stabilise and rejuvenate business networks.

4.4. Paradox 3: Stability vs. change

Innovation, seen as the ability to infuse change in a system or structure, is usually considered a main energising force of business networks. It can uphold and transform interactions among its members by “altering the rules of interaction and related modes of coevolution between connected parties” (Breslin et al., 2021; p. 63). This transformative force, however, is balanced by the need for stability. While innovation introduces change, networks must also retain some degree of constancy to ensure a predictable environment for their members. Endogenous change can arise due to shifts in resources and/or activities within the existing set of actors in the network (Gadde, Hjelmgren, & Skarp, 2012; Håkansson & Waluszewski, 2018), while exogenous change is driven by, for example, alterations in business relationships (Ojansivu, Hermes, & Laari-Salmela, 2020). However, the co-evolutionary view also advances that change and innovations are products of interpreting and representing the meaning of business actors.

Innovation can manifest at the organisation, relationship, or network levels. According to Keränen et al. (2021), companies are often the first to recognise innovation diffusion opportunities in their networks. These innovations can rapidly create new benefits, especially if new actors enter the network. At the network level, new actors help build new connections and facilitate the diffusion of new resources and value activities. However, the entry of new actors and their consequent innovations must be harmonised with the established norms and practices of the existing network, highlighting the constant tension and balance between stability and change. Politics and consumer demand drive firm innovation beyond the societal network. A diffusion process augments the network with new actors, resources, and activities. In a related research stream, Cozzolino, Corbo, and Aversa (2021) note that technological shifts in platform providers impact publishers via cooperative links, while publisher service changes affect platform providers through competitive exchanges.

The IMP and co-evolutionary perspectives share a view of a constellation of entities interacting differently based on their needs. Prior interactions influence future engagements, particularly between unfamiliar parties, due to resource alterations from past interactions (Gadde et al., 2012). From this standpoint, innovation can be driven by different actors, for example, emerging either from users or suppliers. From both ends, innovation usually happens through boundary-spanning objects (artifacts, discourses, and processes, e.g., iterations of prototypes). When a firm deals with others for innovation projects, such as in the case of supplier-driven innovation, these objects work as a bridge for evolving boundaries between partners in the network and allow firms to travel forth and back, as solutions brokers between initial ideas developed with their customers and those co-created with the network of suppliers (Christensen, Munksgaard, & Bang, 2017). In this dynamic environment, the role of stability becomes even more crucial. Consistent practices and structures allow businesses to harness these boundary-spanning innovations effectively without causing actor tie disruptions. This occurs because boundary-spanning objects have specific functions in coordinating and adapting business relationships, i.e., transfer, translate, and transform. This is the case of physical artifacts that help expand the business network due to other actors' observation, touch, and experience with that object (Corsaro, 2018).

Moreover, business actors can mobilise and coordinate resources to adapt to/drive change thanks to internal and external links, while relying on their networks' stable foundational elements to anchor their operations. Business network changes emerge, hence, as in co-evolutionary views, from feedback/feedforward mechanisms between internal/focal business actors and the industry/network level (Bygballe & Ingemansson, 2014). All firms “are simultaneously involved in the ongoing management of the network, and their actions coproduce the resulting structure and performance” (Ritter, Wilkinson, & Johnston, 2004; p. 177). This highlights the built-in IMP paradox, wherein a firm's

relationships result from its needs, but the firm itself is the result of its relationships. Even profound network evolutions transpire gradually (Degbey & Pelto, 2013) but may vary in pace depending on the relationship composition. In the short term, a firm's relationships result from its actions, but in the long term, the firm may primarily result from its relationships.

In conclusion, navigating the balance between stability and transformative innovation is critical for business network members. This paradox calls for a renewed focus in IMP research on the dynamics of boundary-spanning innovations and their functions within business networks. Given the bidirectional interplay and feedback flows between business actors, relationships, and the overarching network level, further exploration is needed on the influence of relationship composition in dictating the pace and direction of network coevolution. Moreover, how firms can leverage stability as a launchpad for strategic innovations, without jeopardising existing actor ties remains a fascinating research avenue for the IMP literature.

5. Discussion

This section discusses how embracing the co-evolutionary perspective can help shed light on business network paradoxes. In this regard, we first explain the main theoretical contribution of our research and then prospect some implications for the research on and practice of the topic.

5.1. Theoretical contribution

As its main contribution to theory, this review demonstrates that applying a co-evolutionary lens to business networks and network paradoxes within the IMP perspective holds important implications for advancing theoretical understanding. By integrating co-evolutionary principles, the IMP perspective gains a framework to explain the change in interactions and reciprocal adaptations between network actors. In other words, incorporating a co-evolutionary perspective enhances the IMP theorizing by providing a more comprehensive explanation of how network actors adapt and evolve in response to each. Moreover, and related, applying a co-evolutionary lens to network paradoxes contributes to the potential resolution of apparent contradictions and tensions with insights for business network adaptation and survival. The dynamic nature of co-evolution captures how conflicting elements (such as competition and collaboration) unfold as processes over time and how they can change as the guiding routines and characters of the parties (co-)evolve. This enriches the understanding of network paradoxes central to the IMP perspective, offering insights into how seemingly contradictory elements coexist.

In Fig. 2, we propose an organising conceptual framework, which emerges from our analysis. Initially, we investigated the core of our research by addressing the three paradoxes found in the IMP literature; these paradoxes serve as the focal point around which our framework revolves. We then linked these paradoxes to the two clusters of opposing factors directly emerging from our RTA of the sampled articles. The *first* cluster regards those factors that make tensions salient, i.e., weak coordinating rules, resource misallocation, the relationship of newness and aging, and Machiavellian behaviour. We visualised these factors as conceptually preceding the paradoxes because they are essentially their antecedents and play a pivotal role in rendering tensions salient. Conversely, the *second* cluster regards those factors as mitigating the salient tensions within business networks. These factors include the development of network capabilities, the practice of co-adaptation, the structural evolution of business networks, and the embodiment of ethical conduct.

We now focus on the two clusters introduced above, starting with that (in Fig. 2) concerning those factors making tensions salient. First, in terms of weak coordinating rules, this can be the case, for example, of a lack of normative commitments in the business relationships in the

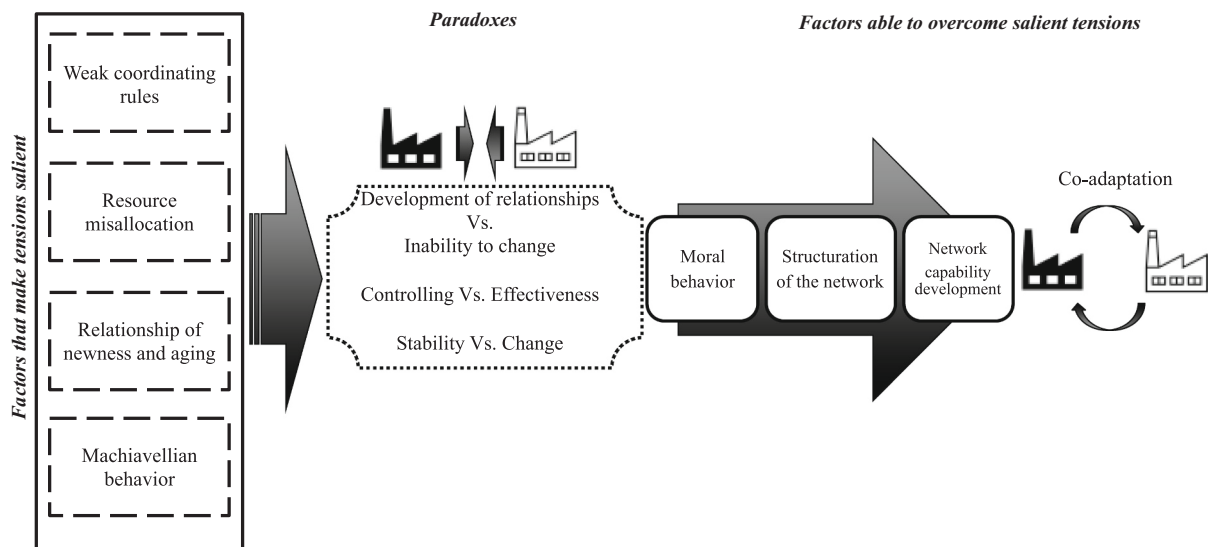


Fig. 2. A co-evolutionary view of how to overcome paradoxes of business networks in IMP research.

network (Andersson et al., 2019), long-term contracts (Keränen et al., 2021), or top management centred decisions (Salmi, 1996). Second, resource misallocation can be constituted by industry regimes in terms of investment maturity in technology (Keränen et al., 2021), difficulty in renegotiating resources in front of radical environmental change (Fang, 2001), or dispersion of critical resources in the case of a high number of actors in the network (Håkansson & Waluszewski, 2018). Third, the relationship of newness and aging mainly substantiates in terms of trust (Aarikka-Stenroos & Sandberg, 2012), which, in turn, is often the consequence of a lack of reputation (McGrath & O'Toole, 2021). Fourth, Machiavellian behaviour can be expressed in terms of a lack of transparency and aggressive behaviour toward new entrants (Cozzolino et al., 2021), opportunistic attitude (Guercini & Runfola, 2012), or coercive power (Meqdadi, Johnsen, & Johnsen, 2017).

On this premise, as our second cluster from the reviewed literature also synthesises, the three paradoxes can be reduced by four factors able to overcome the salient tensions: moral behaviour, network structure, network capability growth, and co-adaptation (see, again, Fig. 2). In the literature, moral behaviour is viewed in terms of communication transparency (Fang, 2001) and, more generally, mutual orientation (Salmi, 1996), which results in mutually harmonizing resources and capacities. Relatedly, the structuration of the network is advanced by introducing stabilizing and, in parallel, destabilizing network routines (Ramaswamy & Ozcan, 2020) or through using institutional entrepreneurship (Matthysens, Vandenbempt, & Van Bockhaven, 2013), mainly when networks are found to be in a self-reinforcing spiral of cognitive and normative institutionalisation. Likewise, network capability development is favoured by dynamic relationship capabilities (Freytag & Ritter, 2005) and relational embeddedness (Gadde et al., 2012). Finally, co-adaptation is seen in terms of (reciprocally) adapting aspirational levels (Low, 1997); these also include the actors' ability to rely on norms, together with their willingness to change these norms as time passes (Medlin, 2004). In detail, co-adaptation can be substantiated in three sequential phases (Cozzolino et al., 2021): selective cooperation, allied competition, and selective cooperation.

5.2. Implications

The ongoing debate surrounding “tensions driving change” (de Resende et al., 2018) versus the counteracting force of “change that mitigates tensions” (Korkeamäki, Sjödin, Kohtamäki, & Parida, 2022) highlights the nuanced dynamics between discord and harmony in business networks. Researching the role of tensions in business

networks, they inherently act as catalysts for change. Nevertheless, without proper management, these tensions, while fostering innovation and growth, can also instigate conflicts, inefficiencies, or the fracturing of network alliances. Within this debate, four salient factors, as we have explained, emerge as pivotal: moral behaviour, network structure, network capability growth, and co-adaptation. These elements inform our understanding and potential resolution of these tensions. Informed by the literature review, our co-evolutionary organising framework, presented in Fig. 2, embodies these considerations. Building on this foundation and connected to the co-evolutionary background of our work, we now put forward five implications constituting potential opportunities for future research on (and practice of) these tensions.

First, we have written that *dialectical thinking*, i.e., a supposed “thesis/antithesis/synthesis” relationship (Benson, 1977), is at the basis of any co-evolutionary relationship (e.g., Abatecola et al., 2020; Lewin & Volberda, 1999). In this view, paradoxes appear in the resulting synthesis of different kinds of thesis/antithesis relationships, namely a) weak coordinating rules versus structuration of the network; b) resource misallocation versus network capability development; c) relationship of newness and aging versus co-adaptation, d) Machiavellian versus moral behaviour. In this regard, how does the dialectical, co-evolutionary relationship between these factors vary when different kinds (e.g., innovation versus entrepreneurial) of co-evolutionary ecosystems are considered?

Second, one property of co-evolution is *specificity*, which, as also written, in ecology means that one specific party causes the evolution of a character in another party. Regarding the factors allowing the salient tensions to be overcome, specificity would thus require observing a specific dependent relationship between and among the elements. In other words, for example, network capability development (e.g., McGrath & O'Toole, 2021) should be observed occurring as the consequence of the structuration of the network (e.g., Guercini & Tunisini, 2017); relatedly, co-adaptation (e.g., Aarikka-Stenroos & Sandberg, 2012) should be seen occurring as the consequence of moral behaviour (e.g., Crick & Crick, 2021). Relatedly, which, between the environment and strategy, drives *specificity*? Assuming also a practice-oriented perspective, we believe that cross-country/culture/industry qualitative comparisons could be helpful here in that they could help to shed light on the differences/similarities led by institutional and/or business characteristics. In particular, these comparisons could be helpful to understand whether (and how) the types of co-evolution (i.e., antagonistic, competitive, and mutualistic) observed in our reviewed literature evolve, e.g., from competitive to mutualistic and vice versa (Breslin

et al., 2021).

Third, another property of co-evolution is *reciprocity*, which means that characters evolve in both parties because of the other. In our case, the exchange would require relationships of interdependent feedback. In this view, for example, whilst moral behaviour results in an antecedent of co-adaptation, the opposite should also hold true. Likewise, whilst the capabilities in the business network (e.g., Eriksson, Hulthén, & Pedersen, 2020) should prove to ameliorate because of the implemented network structuration, one should also be able to demonstrate that the latter has per se progressed because of the improvement of the former. Moreover, how much does the *past* affect the co-evolutionary relationship between these factors? In other words, what is the role of path dependence and self-reinforcing decision-making processes in impacting this relationship?

Fourth, the last property of co-evolution is *simultaneity*, i.e., characters evolve in both parties parallel in time. Considering this and being specific and reciprocal in their effects, our four factors should be all agents of contemporaneous change individually (Murmans, 2013). Relatedly, the overall effect of this individual, although collective, change may vary depending on the case; this, in turn, may ultimately originate differences in terms of the types (i.e., mutualistic, antagonistic, and competitive) of co-evolutionary relationships in the business networks (Breslin et al., 2021), as also found in our reviewed literature.

Lastly, it seems clear that a *circular* relationship exists between the factors. As depicted in Fig. 2, we advance here that the real beginning of this relationship is conceptually fostered by moral behaviour, which can be assumed as a *primus inter pares* among the factors (Cafferata, 2016). Moral behaviour can increase reciprocal trust between and among the parties, allowing a more efficient and effective structuration of the network. Accordingly, the implemented structuration permits the network capabilities to improve; these, in turn, catalyse the enhancement of co-adaptation processes. Finally, these processes revolve back to moral behaviour, which continues to rise in all the parties involved in the business network.

What is stated above can lead to one final, potentially significant, implication for further research in this field. We claim that, in the future, the contribution of co-evolutionary inquiries to understanding business network paradoxes could significantly benefit from a more fine-tuned focus on the role of human intentionality (e.g., the Machiavellian versus moral behaviour highlighted above). This focus, we believe, could benefit from embedding a more formal behavioural perspective in the research design of the studies. To this end, the fast-growing “behavioural strategy” field could help. This field, as known, aims to construct a *psychological architecture* of the firm by bringing “realistic assumptions about human cognition, emotions, and social behaviour to the strategic management of organisations” (Powell, Lovallo, & Fox, 2011; p. 1374; see also Cristofaro, Butler, Neck, Parayitam, & Tangpong, 2022). Thus, especially from entrepreneurial and managerial perspectives, it would be interesting to understand whether and how the firm-specific-based assumptions of behavioural strategy can be applied when collective units of analysis, in this case business networks, are considered.

6. Conclusions

How can studying paradoxes in business networks help understand the networks' adaptation and survival? IMP scholars argue that studying paradoxes is fundamental to comprehending how the interconnected actors of a business network adapt. Using a co-evolutionary perspective as a distinctive feature, our study has thus answered this question by reviewing 41 articles selected through rigorous inclusion criteria. In this regard, we have explained how the many shared ontological commitments between co-evolution and IMP make the former a good theoretical support for the latter.

Our analysis shows that some factors, such as weak coordinating norms, resource misallocation, relationship of newness and aging, and

Machiavellian behaviour, make tensions noticeable. At the same time, in contrast, our analysis also shows that some factors, such as moral behaviour, structuration of the network, network capability development, and co-adaptation, can serve to reduce these tensions. To capture the big picture regarding the relationship between paradoxes and tensions, we thus proposed a co-evolutionary conceptual framework and accordingly put forward implications for research and practice.

In conclusion, we hope that our work can serve as valuable input for future conceptual and empirical research in the domain of industrial marketing management. At the same time, we acknowledge that, from a methodological point of view, this input still needs to be considered as a beginning, and limitations exist; we are aware that, at this stage, we only looked for articles on business network paradoxes explicitly taking the IMP literature standpoint. In this light, we may argue that our *less-is-more* approach is useful at this stage, especially considering the novelty of the co-evolutionary perspective for the field with which we have networked in this research.

CRedit authorship contribution statement

Matteo Cristofaro: Conceptualization, Formal analysis, Methodology, Visualization, Writing – original draft, Writing – review & editing, Supervision. **Gianpaolo Abatecola:** Writing – original draft, Writing – review & editing. **Johan Kask:** Formal analysis, Writing – original draft, Writing – review & editing.

Data availability

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

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