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Drivers, facilitators and barriers**

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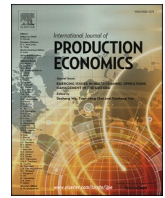
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Joint B2B supply chain decision-making: Drivers, facilitators and barriers

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ABSTRACT

Joint decision-making is one of the coordination mechanisms to address the inherent complexity of business-to-business (B2B) processes within a supply chain. Joint decision-making can be helpful to define shared goals and objectives, identify supply chain failures and opportunities, and consolidate supply chain success. Parties may benefit directly from a partnership's potential and synergies by collaboratively making decisions. However, specific business conditions need to be in place to enable joint decision-making. This paper investigates how companies in a dyadic relationship arrive at joint and individual supply chain decision-making structure. We examine the drivers, facilitators, and barriers of making joint as well as individual decisions within the supplier-buyer dyad and frame our arguments borrowing perspectives from resource dependency theory, transaction cost economics, collaboration theory, and social exchange theory. The paper presents a case study of Dutch high-tech companies, analysing experiences of supply chain managers via semi-structured interviews. High-tech firms often collaborate and share supply chain decisions due to the high-value capital equipment as well as a shared dependency on highly specific scarce resources. Our study provides new empirical insight into how firms cope with conflicting drivers, facilitators, and barriers in collaborations, controlling their decision-making structure. From the case study, we identify the combinations of facilitators and drivers that tend to promote the existence of joint decisions. We conclude with providing a list of suggestions for decision-makers and future research.

1. Introduction

Companies have to make many decisions every day. As members of supply chain network, it is inevitable that companies often depend on—and have to collaborate with—their partners when making supply chain decisions. Prior to collaborating, however, companies may need to decide whether certain suppliers and customers are worthy to be involved as partners in their decision-making. Further, companies also need to verify their decision-making motivations—what are the circumstances that influence companies to favor making joint decisions with partners over making decisions individually?

Joint decision-making is a vital collaborative mechanism to address the inherent complexity of interdependencies within supply chains (Arshinder et al., 2011). Joint decision-making refers to the use of cooperatively gained information to solve issues and set long-term objectives (Revilla and Knoppen, 2015). It consists of two primary stages: front-end agreement and joint business planning (Panahifar et al., 2015). Supply chain partners may build supply chain strategies and processes together within the agreed scope of the decision. Making decisions jointly can especially enhance interdependent processes such as

demand forecasting, marketing planning, joint production scheduling, or operational concerns (Heide and John, 1990). However, there is insufficient discussion in the literature that contrasts the benefits of joint decision-making with its individual counterpart, and thus it requires further investigation. Hence the paper's objective is to provide a further understanding of why and in which environment companies choose to make supply chain decisions jointly rather than individually. Below we explore the antecedents of our work in the literature in more detail and discuss research questions, scoping and theoretical framing of the study thereafter.

1.1. Benefits of joint decision-making

Across the literature, joint decision-making has been proven to bring favorable outcomes at operational level up to strategic level (see Table 1). Firstly, making decisions jointly allows buyers and suppliers to address performance-related improvements. Joint decision-making allows improvements by means of providing the platform for decision-makers to see first-hand how inter-firm operations work and what to do to keep them working optimally (Revilla and Villena, 2012).

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Table 1
Benefits of joint decision-making.

Benefit	Example	References	
Improved performance	Improved visibility across operations	Revilla and Villena (2012)	
	Effective operations	Frohlich and Westbrook (2001), Sahin and Robinson (2002), Malhotra et al. (2005), Modi and Mabert (2007)	
	Boosted performance	Prajogo and Olhager (2012)	
	Improved responsiveness to demand changes	Attaran and Attaran (2007)	
	Improved cost savings	Sanders (2008)	
	Fast conflict resolution, fast completion of tasks such as reducing costs or increasing production	Frohlich and Westbrook (2001), Frohlich and Westbrook (2001), Sahin and Robinson (2002)	
	Reduced logistic costs, increased order fulfillment, improved quality, pricing, delivery, as well as enhanced sales and profit margins	Singh et al. (2018)	
	Value co-creation	Better anticipated future issues, better identification and prediction of failures and successes, ideas generation for meeting customer needs, and better articulated strategies and goals	Revilla and Knoppen (2015)
		Better capitalisation of possibilities and synergies inherent in partnership	Anderson and Narus (1990), Dwyer et al. (1987), Jap (1999)
		Improved perception, integration, and utilization of resources, capacity, or assets from partners	Lane and Lubatkin (1998), Park and Ungson (1997)
Fostered synergistic resource development and cooperative investments		Edlin and Reichelstein (1996), Aoki and Lennerfors (2013)	
Improved financial success for both parties and higher engagement in value co-creation activities		Lambert and Enz (2012)	

Inter-firm operations are effective when buyers and suppliers make joint decisions to fix issues (Frohlich and Westbrook, 2001; Sahin and Robinson, 2002; Malhotra et al., 2005; Modi and Mabert, 2007). Past literature provides examples of making decisions jointly with a collaborator, such as joint quality improvement decisions involving customers and suppliers have been shown to boost performance (Prajogo and Olhager, 2012). According to Attaran and Attaran (2007), suppliers can better respond to demand if they plan with their customers. Sanders (2008) also claims that joint decision-making directly affects operational advantages such as cost savings. Tasks of reducing costs or increasing production, or resolving conflicts are completed fast through joint decision-making (Fugate et al., 2009; Frohlich and Westbrook, 2001; Sahin and Robinson, 2002). Thus, decision-makers need to recognize the direct and indirect advantages of collaborative supply chain decision-making; that it boosts business performance, reduces logistic costs, increases order fulfillment, improves quality, pricing, delivery, as well as enhances sales and profit margins (Singh et al., 2018).

Secondly, joint decision-making is also strategically beneficial for firms to co-create more excellent value. By favorably influencing inter-firm relationship performance, joint decision-making can help buyers and suppliers anticipate future issues, identify and analyze supply chain failures and successes, generate ideas for meeting customer needs, and articulate strategies and goals for each partner (Revilla and Knoppen, 2015). Joint decision-making also enables both organizations in a dyad to capitalize on possibilities and synergies inherent in their partnership (Anderson and Narus 1990; Dwyer et al. 1987; Jap 1999). Companies can perceive, integrate, and utilize resources, capacity, or assets from

each other via frequent joint decision-making (Lane and Lubatkin 1998; Park and Ungson 1997). Joint decision-making indicates a need for synergy in shared assets and resources. This need relates to Edlin and Reichelstein's concepts of "selfish investments" versus "cooperative investments" (1996). Through joint decision-making, synergistic resource development is fostered. For instance, when a buyer incorporates a supplier early in product development decisions, innovativeness is increased (Aoki and Lennerfors, 2013). Cross-functional engagement such as joint decision-making is also found to be a critical driver of financial success for both parties in a dyad, and it allows customers and suppliers to engage in three cyclical stages to co-create value: (1) value propositions, (2) value actualization, and (3) value determination (Lambert and Enz, 2012).

1.2. Assessing drivers prior to making joint decisions

In the context of dyadic collaboration, ideally, both firms strive for a decision outcome that satisfies each party. However, sometimes firms have different and conflicting interests, goals and business priorities that later drive their decision-making process. Therefore, to maximize the value creation potential of corporate relationships, managers require a practical worldview that can help them assess drivers, find collaboration possibilities, and collaborate across enterprises (Lambert and Enz, 2012). We discuss the components necessary to conduct drivers assessment of joint decision-making (see Table 2).

Goal congruence is key to successful joint decision-making, and it can be achieved through aligning drivers. Despite unique characteristics of companies (e.g. cultural and behavioral differences), collaborative efforts could be successful when both objectives are studied and converged (Huang et al., 2020). For example, prior to making joint decisions, suppliers need to be aware of their intention, and at the same time their partner's intention. Manufacturers are more inclined to coordinate decisions with their suppliers if they believe it would benefit product development (Huang et al., 2020). In Lambert et al. (1996) earliest studies about the development and implementation of supply chain partnerships, aligning drivers was prescribed to mitigate conflicts early on. Further investigations and empirical studies were called for to map out partnership strategies better. This included understanding how a diversity of drivers could affect joint decision-making.

However, aligning drivers is not the easiest task. It is understood that the process of aligning drivers is "dynamic" and "complex" (Lambert et al., 1996). Lambert and Enz (2012) targeted four critical categories of drivers to align in joint decision-making. First, the *asset/cost efficiencies* category comprised drives to improve asset utilization and reduce costs in areas such as product, transportation, handling, packaging, information, and management efficiency. Second, *customer service* drivers included greater product availability and more timely and accurate information, which would lead to higher sales. Third, the *marketing advantage* category includes perks including improved access to technology, better product quality, and the creation of inventive new items. Fourth, the *profit stability/growth* group comprised factors such as

Table 2
Components of drivers assessment.

Component	References
Ensuring shared worldview and attitude on value co-creation and exploring collaboration possibilities	Lambert and Enz (2012)
Studying the internal and partner's objectives	Huang et al. (2020)
Analyzing the benefits of joint decision-making for both parties	Huang et al. (2020)
Assessing asset and cost efficiencies, service improvements, marketing advantage and improved growth stability	Lambert et al. (1996), Lambert and Enz (2012)
Standardizing and improving data format and data transmission necessary for information exchanges	Chang et al. (2019)
Assessing room for improvement and defining goals	White (1999)
Using shared drivers to co-develop strategy	Lambert and Enz (2012)

long-term volume agreements, decreased sales unpredictability, reduced pricing variability, collaborative use of assets, and secured supply (Lambert and Enz, 2012).

Without the conscious effort to assess these drivers and interests, companies may be prone to making unsustainable joint decisions without clarity in intention or long-term benefits. For instance, coercive pressure from supply chain members, including rivals and cooperative partners is an inter-organizational issue that may also lead companies to make joint decision-making. Two organizations in a supply chain may integrate their business systems, resulting in standardized data formats and improved information transmission under the shadow of peer pressure (Chang et al., 2019).

Further, White (1999) argued that companies must identify areas for improvement and explicitly define what they want to accomplish via collaborative decision-making. If the other firm says they could not or would not assist, the driver should be re-evaluated or dropped. The idea is to find shared drivers from both sides to use as groundwork for developing a strategy to pursue mutually selected projects (Lambert and Enz, 2012). In this study, we attempt to shed light on this complexity by collecting evidence of what companies would do in the face of conflicting drivers, whether they would opt for joint decision-making or avoid it.

1.3. Research questions

Given the examples of benefits or favorable outcomes of joint decision-making, we investigate the **drivers and facilitators** that lead firms to opt and manifest a certain decision-making mechanism or structure in a collaborative context. We assume that companies have a certain degree of freedom to choose whether they want to involve their partners or not in a decision-making process. This freedom to choose between making decisions individually versus jointly has been discussed by Lambert et al. (1996) in the paper “So you think you want a partner”. Lambert suggests that sometimes initiating a joint effort with another firm could be quite costly, and the risk could sometimes outweigh the benefits. In this study, we build upon this idea to describe the extent to which partnership drivers manifest into the decision-making structure. Furthermore, even when sufficient drivers exist to entice a firm to make joint decisions, in some cases, there are not enough facilitators or enablers to support this initiative. Following that logic, we postulate that when decision drivers meet facilitators, the likelihood of companies to choose joint decision-making, as opposed to individual, is higher.

We use the word “drivers” to address decision-makers motivation, aspiration, interest, and goals when making a decision. On the other hand, “facilitators” include the circumstances, tools, platforms, or environments that enable the implementation of the decision-making process. These constructs are developed based on Lambert et al. (1996) model of “The Partnering Process” which highlights that two variables influence a choice to form or modify a partnership: 1) drivers, which are reasonable grounds to collaborate, and 2) facilitators, which are supporting contextual conditions that promote relationship advancement.

To clarify the problem, in this research, we develop a construct of “decision-making structure”, which refers to the steps or mechanisms taken by an actor in a decision-making process within a collaborative framework to opt for making a decision individually or jointly with partner. This paper addresses the following research questions (RQ):

RQ1. What are the main sets of drivers and facilitators that allow joint supply chain decision-making to happen across high-tech suppliers and manufacturers?

RQ2. What are the barriers for these companies to make joint decisions?

In this study, we begin by observing the environment of firms that may support firms’ tendencies to either make decisions jointly with another firm or on their own. This dichotomy of structures helps us to

operationalize the problem being discussed. With this approach, we also postulate that different sets or co-occurrences of certain drivers and accompanying facilitators support different decision-making structure (either individual or joint decision-making).

The remainder of the paper is structured as follows. Section 2 revisits the literature and theoretical lenses, as well as providing multiple industrial contexts. Section 3 discusses methodology and research design employed in this study. In section 4, we present our results and discussion including the co-occurrence of joint decision-making drivers and facilitators. Finally, in section 5, we conclude the research with our key findings and provide theoretical and managerial insights.

2. Literature review

2.1. Theoretical background

We combine resource dependency theory, transaction cost economics, collaboration theory, social exchange theory, and previous research on dyadic interactions and buyer-supplier value to frame our arguments.

2.1.1. Resource dependency theory

According to the concept of resource dependency, interfirm relationships are formed to manage transactional and financial interdependence (Pfeffer, 1982, p. 206). A collaboration is a mechanism to manage technical, social, logistical, administrative, and knowledge dependencies (Niemelä, 2004). Companies access resources to gain further competitive advantage. The resource-dependence perspective also suggests that stakeholders require resources to have a leverage over their partners (Saito and Ruhanen, 2017). When partners have confidence in one another’s skills and resources and expect them to be utilized frequently, the relationship’s expected returns are favorable. One may also argue that both parties will invest more in making decisions jointly to maintain access to collective resources. This increases the cost of switching partners and strongly drives partners to continue the collaborative efforts (Voss et al., 2019).

2.1.2. Transaction cost economics

Transaction-cost economics (TCE) examines how expenses impact coordinating mechanisms (Williamson, 1975). Closely related firms are expected to exchange more information. However, sharing additional information may raise transaction costs. TCE argues a high degree of integration has some positive impacts, such as more coordination between trade partners, which may make it simpler for them to react to outside developments, such as volatility in customer demand. From this perspective, TCE may help to explain the importance of having certain facilitators available to enable the efficiency of joint decision-making process. Using TCE, one may argue that the existence of platform integration facilitates collaboration and indirectly contributes to fewer out-of-stock products, more precise delivery, and greater sales (Madlberger, 2009).

2.1.3. Collaboration theory

Collaborative fit is considered to be the key prerequisite of successful joint decision-making. Collaboration is defined as joint rather than unilateral actions of planning and problem-solving (Heide, 1994; Zaheer and Venkatraman, 1995) and the ability to make alterations upon requests and agreements of all parties involved (Bello and Gilliland, 1997; Noordewier et al., 1990). Collaborative fit is reflected, among others, by the commitment to accommodate others and the ambition to accomplish shared objectives (Anderson and Narus, 1990; Morgan and Hunt, 1994). From a collaboration perspective, the need of a company may extend beyond the transactional and operational levels. Reaching a strategic level of expansion and growth, for example, will likely need the synergistic effort from a collaborator, who must have aligned drivers and abilities to facilitate shared goal attainment.

The scope of collaboration covers two main dimensions (Panahifar et al., 2015). First, joint planning addresses future challenges within a relationship. To develop contingency, upstream information about trends and demands are quickly and proactively communicated with end-users. Consequently, firms will be ready to exchange knowledge regarding future activities and commit to executing joint decision-making. Second, joint problem-solving addresses issues stemming from downstream events such as sales and consumer’s needs and reacting to conflicts in this area requires sharing knowledge among collaborators (Stern et al., 1996). Downstream information includes highly relevant end-user data on the product, pricing, quality, and quantity details important for negotiating a mutually satisfying solution for all collaborators involved (Panahifar et al., 2015).

Considering the complexity of these dimensions, actors in a dyad should evaluate their partner not solely based on technical and economic factors for future transactions but also on collaborative fit with their own company. This can be done, for instance, prior to the commencement of a project, companies should evaluate the quality of collaboration in previous projects involving a given collaborator (Hoegl and Wagner, 2005). From this perspective, one may argue on the importance of driver assessment as well as risk analysis before proceeding to make decisions jointly. The absence of a collaborative fit should be considered a detrimental factor when two companies are faced with the option to make supply chain decisions jointly.

2.1.4. Social exchange theory

The benefits of collaborative decision-making may not mean the same for all companies whose business priorities may vary from each other. The mere ability to make joint decisions and having the supporting circumstances to do so does not directly reflect the true willingness and intention of companies to collaborate. To distinguish between competence and the willingness to collaborate, we may dive deeper to examine the fundamental underlying motivation of each actor to work together.

Social exchange is described as voluntary behaviors of persons motivated by the anticipated benefits they are expected to bring from others (Blau, 1968). A viewpoint based on social exchange theory posits that actors provide benefits willingly, eliciting a duty on the other party to reciprocate by delivering some benefit in return, to a certain extent. It is interesting to understand further to which extent this accommodation is given, not knowing to what extent the other party would return the favor. Due to the fact that social interactions are voluntary and sometimes un-contractual, they function in an unpredictable environment, in which there is no assurance that advantages will be reciprocated or that reciprocation would result in future benefits (Das and Teng, 2002). This perspective highlights not only the potential return but also hazards of interacting within collaborative mechanisms, including joint decision-making.

Social exchange theory explains how companies collaborate. This theory may also explain why companies help others given limited return (Madlberger, 2009). While TCE addresses dyads as transactional relationships, social exchange theory provides the nuances by treating companies as interacting social entities. This perspective complements TCE theory to address the intangible or behavioral aspects that may facilitate collaborations. From this perspective, we may further explain the importance of identifying what types of social and behavioral interventions or facilitations are needed to enable collaborative decision-making to achieve its intended goal.

2.2. Drivers and facilitators of joint decision-making

2.2.1. Drivers of joint decision-making

Based on strategic management theory, companies may utilize a number of governance systems to boost their competitiveness, but their objectives are the same. Any form of partnerships are created for a number of reasons, including short-term efficiency, resource access,

market position, worldwide expansion, risk reduction, competitive blockades, economies of scale, speed to market, lower transaction costs, pooled investments, and so on (Tjemkes et al., 2017). As observed further in the literature, drivers of joint decision-making are discussed below (see Table 3).

2.2.1.1. To access and grow new markets. In a competitive environment, collaborative efforts may help companies mitigate barriers to entry into a new market, especially if it is a saturated one with existing competition such as cartels or monopolies. According to Zhang (2014), collaboration generally boosts market share. Collaborative forms of decision-making may give companies access to market expertise and sharing of the financial burden, which results in quick, multi-market development and penetration (Zahoor and Al-Tabbaa, 2021). In market expansion efforts, for instance, making decisions with local partners who have foreign expertise is critical for companies to grasp the internationalization process (Zahoor and Al-Tabbaa, 2021). Joint decision-making is also a way to improve communication and to empower customers, which consequentially results in improved export performance (Efrat and Øyna, 2021). By making decisions jointly, information as an important intangible asset is exchanged between partnering companies, allowing for commercial prospects and competitiveness to increase (Zhang, 2014).

To adapt to market developments, flexibility, and changes in client base.

To face market volatility in several industries, joint decision-making is considered to be an effective mechanism in mitigating uncertainties and increase responsiveness. For example, in high tech industry, a rapid pace of innovation is key to maintain competitiveness. Prior research shows that innovation within a company typically requires external participation and collaboration, which will speed up learning and responding to industry-specific business needs (Chen et al., 2021). To mitigate volatility within N-tier levels of supply chain partners, Indian companies have made considerable efforts to establish high levels of collaborative efforts and long-lasting, solid ties with their partners (Agarwal and Narayana, 2020). By making decisions together with partners such as via vendor mentoring activities, any change is detected early, which may result in maintained supply chain performance and improved processes.

2.2.1.2. To access resources, capacity, or assets of the collaborator. Joint decision-making is one of the mechanisms to access strategic resources from supply chain partners. Through making collaborative efforts with a selected supply chain network, a firm may rapidly access important information, experience, and technology to help develop a new product (Chen et al., 2021). For example, in the automotive industry, joint decision-making allows supply chain partners to share tangible and intangible assets and demand fulfilment capabilities. This is done through shared investment decisions in product design, infrastructure,

Table 3
Drivers of joint decision-making.

Driver	References
To access and grow new market	Zhang (2014), Zahoor and Al-Tabbaa (2021), Efrat and Øyna (2021)
To adapt to market development, flexibility and changes in client base	Chen et al. (2021), Agarwal and Narayana (2020)
To access resources, capacity, or assets of the collaborator	Chen et al. (2021), Huang et al. (2020)
To share risks with collaborator	Chen et al. (2021), Efrat and Øyna (2021), Singh et al. (2018), Zhang (2014)
To incite more commitment from collaborator	Chang et al. (2019), Agarwal and Narayana (2020)
To align financial incentives with collaborator	Agarwal and Narayana (2020), Lambert et al. (1996), Zhang (2014), Singh et al. (2018)
To reach target cost	Zhang (2014)

production process, costs, and value chain which are keys to competitive advantage (Huang et al., 2020). Huang et al. (2020) also suggest that this collective decision-making often results in hard-to-replicate trade knowledge, leading to a supply chain that outperforms competitors, forcing rivals to earn experience and competence through time.

2.2.1.3. *To share risks with a collaborator.* Sharing risk with outside partners may allow room to be daring during experimentations and may inspire creativity and innovativeness during new product development and research (Chen et al., 2021). Small and resource-constrained multinational businesses often seek to lessen the risk of market expansion by using collaborative entrance approaches (Efrat and Øyna, 2021). Risk and responsibility sharing is a concern that may be resolved by collaborative efforts across the supply chain (Singh et al., 2018). In the high-tech industry, for instance, joint decision-making in areas of innovation and investment with suppliers could help manufacturers to better address the make-or-buy dilemma. This leads to lowered development expenses, reduced technological uncertainties, as well as more distributed risks (Zhang, 2014).

2.2.1.4. *To incite more commitment from a collaborator.* Besides providing opportunities of improved finances, the incentives of joint decision-making could go beyond, for instance stronger commitment and favorable behavior from collaborators. Chang et al. (2019) suggests that the benefits of collaborative efforts is not only in mutually reduced expenses but also social objectives. According to Agarwal and Narayana (2020), the form of these rewards is not limited to the financial dimension (e.g. pricing, cost-sharing, investment), but could also be behavioral (e.g. psychological contracts, fair policies, commitment, information sharing), structural (e.g. logistics information integration, process flexibility), and relational (e.g. trust, stronger collaboration, dependence, commitment, power, and satisfaction).

2.2.1.5. *To align financial incentives with a collaborator.* Joint decision-making may also be driven by predetermined reward expectations that are valued by both parties (Agarwal and Narayana, 2020). According to Lambert et al. (1996) partnership model, collaboration is driven by financial as well as technical competence. Further, any type of collaboration allows businesses to get access to limited resources, enhance productivity, and extend product offerings, all of which save them money (Zhang, 2014). Through collaborative process optimization approaches for evaluating production cycles, for example, supplier and manufacturer could have transparency on all scenarios, the needed step-ups and associated costs, as well as potential rewards that accrue. In this situation, it is easier for companies to align on financial incentives later on (Singh et al., 2018).

2.2.1.6. *To reach target cost.* Using economies of scale, joint decision-making in areas of production, inventory, and logistics may help companies to cut costs. Generally, collaborations reduce overall expenses by cutting manufacturing and administrative expenditures, by sharing information, services, or activities. By doing so, collaborations eliminate duplicative expenses and surplus capacity (Zhang, 2014). It is also understood that human capital or labor is a significant production variable, which contributes for significant costs across companies. Therefore, as Zhang (2014) also suggests, collaborative decision-making in the areas of production with suppliers who have considerably well-skilled labor with lower costs (typically in developing countries) could help companies to cut production costs while maintaining competitiveness.

2.2.2. *Facilitators of joint decision-making*

Being aware of the drivers and aligning them with partners is the first step towards successful joint decision-making. To be able to execute it, however, there are different capabilities, enablers, or facilitators necessary for companies to possess. A good joint decision-making

capability implies that the organization’s system works well with other systems, enabling it to operate with supply chain partners, spanning across organizational boundaries (Chang et al., 2019). By having these capabilities or facilitators, firms will be able to make better judgments and engage seamlessly with business partners. The extant literature provides examples of facilitators that can be cultivated to intervene and support a joint decision-making culture. These facilitators are discussed below (see Table 4).

2.2.2.1. *Ease of access.* Similarity of company norms and values creates a certain degree of social compatibility that allows partners to accomplish shared goals in supply chains (Cheung and To, 2010). Compatibility facilitates communication between partners by reducing communication barriers (Kale et al., 2001). It also underpins the desire to explore new possibilities (Saenz et al., 2014). Due to the time and energy spent resolving disagreements (Inkpen and Tsang, 2005; Lei et al., 1997), a lack of social and cultural commonalities and compatible values might hinder the development and implementation of new operational and strategic improvements (Holcomb and Hitt, 2007). It is essential to harmonize corporate ideologies and negotiate better conditions for mutual benefit. Therefore, parties in a dyad seeking to improve their short- and long-term competitiveness should strive for cultural alignment and mutually beneficial aims with each other (Villena et al., 2011). The more regular and extensive contact between channel participants, such as customers and providers, the less ambiguous the message (Hoegl and Wagner, 2005). This contact creates ease of access among decision-makers.

2.2.2.2. *Platform integration for information sharing.* Sharing information about the content and progress of the collaborative work product keeps all project participants informed and able to use it in their work, leading to better joint performance (Ragatz et al., 1997). Having shared or commonly used systems like ERP (Enterprise Resource Planning) or EDI (Electronic Device Interchange) could also facilitate actors to establish joint decision-making so that they may oversee all operations undertaken within their collaborative framework. When a firm has a strong IT infrastructure and can interact successfully with other organizations, it can make swift changes to its system and business strategy in response to a changing business environment (Chang et al., 2019).

2.2.2.3. *Established contract or agreement.* Contractual clauses with mutual consent can curb opportunistic behavior and protect specific investments (Williamson, 1987). It defines and governs both parties’ rights and duties by written rules, terminology, and processes while specifying future circumstances (e.g. product liability, trade procedures, noncompliance fines) (Panahifar et al., 2015). Integrating expert suppliers might provide the organization with skills it lacks internally. Expert suppliers may help reduce costs (Mason, 2007) and construction complexity (Leiringer et al., 2009). Mason (2007) also observed that

Table 4
Facilitators of joint decision-making.

Facilitator	References
Ease of access	Cheung and To (2010), Kale et al. (2001), Saenz et al. (2014), Inkpen and Tsang (2005), Lei et al. (1997), Holcomb and Hitt (2007), Villena et al. (2011), Hoegl and Wagner (2005)
Platform integration for information sharing	Ragatz et al. (1997), Chang et al. (2019)
Established contract or agreement	Williamson (1987), Claro and Claro, 2010, Mason (2007), Leiringer et al. (2009), Mayer and Teece (2008), Bildsten (2014)
Transaction history	Lambert and Enz (2012), Johnston et al. (2004)
Trust and openness	McEvily et al. (2017), Revilla and Knoppen (2015), Eisenhardt (1989), Lee and Choi (2003), Blau (1968)

deep and long-term connections among expert providers are valued for providing stable income and a better working environment based on terms in a contract. Mayer and Teece (2008) argued that a well-structured contract should contain delivery requirements and advice on activities linked to learning, knowledge transfer, joint decision-making, and conflict prevention. Therefore, a contract may foster intimate relationships between buyers and providers (Bildsten, 2014).

2.2.2.4. Transaction history. Past transactions help provide data to analyze the financial performance in the past from a joint initiative. Financial information concerning the results of joint collaborative ventures, such as revenue growth and improvement of income, might influence managers' estimates of relationship value (Lambert and Enz, 2012). On a similar note, past experience between supplier and buyer is considered adequate to assist the buying company handle inter-firm activities better, resulting in more successful partnerships (Johnston et al., 2004).

2.2.2.5. Trust and openness. As a relational notion, trust is understood as shared and defined by both parties in a transaction. The relational focus stems from the sociological idea that trust is a social attribute, not an individual trait (McEvily et al., 2017). Inter-organizational trust arises when both parties know themselves and develop mutual commitments. Trust is one of the facilitators of joint decision-making (Revilla and Knoppen, 2015). Since companies need to share delicate information to make joint decisions, which could be a significant asset, there is a risk that it can be exploited asymmetrically to benefit an opportunistic chain member (Eisenhardt, 1989). This suggests that parties will only disclose information and engage in knowledge exchange and development, if they feel their weaknesses will not be exploited by the other side (Lee and Choi, 2003). Consequently, trust motivates buyers and suppliers to align their best interests and activities. Additionally, social exchange theory presupposes trust's inherent aspect of any social transaction. However, trust is also thought to be generated by the continuous social exchange process: processes of social trade, which may start in pure self-interest, produce trust in social interactions by virtue of their recurring and steadily growing nature (Blau, 1968). Therefore, trust may be linked to repeating past transactions since trust is nurtured by a continuous reciprocal process in which acts are dependent on receiving favorable responses from others (Blau, 1968).

2.3. Associated risks

2.3.1. Risks of joint decision-making

Despite the vast benefits it offers, joint decision-making structures remain challenging to manage, especially when there is no pre-existing contract that explicitly and strictly governs the process among decision-makers in a dyadic relationship. There remains guesswork and uncertainty when identifying the urgency, value, and risks of joint decision-making with a particular collaborator. Further, despite the extant literature that examines the benefits of joint supply chain decision-making, it does not sufficiently address how interests and motivations may vary across different companies and industrial sectors.

We identified the reasons that hinder companies to make joint decisions and that may bring them to decide on a matter individually instead. Among these reasons are fear of relational elements such as non-reciprocity, protection of profit margin, self-sufficiency of information, process simplification, intellectual property (IP) protection, quality preservation, timesaving, and lack of willingness and/or capabilities among collaborators. Below we discuss some of these reasons (see Table 5).

According to literature, to reach collective objectives, buyers and suppliers across dyads should mutually agree on a relational norm or standard behavior when they have to practice joint decision-making

Table 5
Risks of joint decision-making.

Risk	References
Diminished or misalignment of profit margin	Panahifar et al. (2015)
No significant added value due to self-sufficiency on information	Tjemkes et al. (2017)
Lengthy process, lost time resources	Huang et al. (2020)
Lack of commitment, willingness, and/or capabilities among collaborators to execute decision-making or outcome	Huang et al. (2020), Scuotto et al. (2017), Alsaad et al. (2019), Irani et al. (2017)
Opportunism and other relational conflicts	Poppo and Zenger (2002)
Overly divergent goals, disputes over the domain of decision-making and priorities, and conflicting perceptions	Arshinder et al. (2011)
Constrained decision-making due to binding contract, unexpected events leading to contract violation	Bernheim and Whinston (1998), Liu et al. (2009)

(Macneil, 1993; Moch and Seashore, 1981). However, the extent to which buyer-supplier dyads comply with this relational norm through communicating relevant information, extensively sharing ideas, resolving disagreements and difficulties via joint decision-making may vary from one relationship to another (Macneil, 1993; Heide and John, 1990; Jap and Ganesan 2000). Furthermore, a relational norm does not impose strict rules to govern a joint decision-making structure, lacking explicit assertions and binding limits, which may risk and expose partners to opportunism and other relational conflicts (Poppo and Zenger, 2002). These relational conflicts can manifest into overly divergent goals, disputes over the domain of decision-making and priorities, and conflicting perceptions of reality employed in joint decision-making (Arshinder et al., 2011).

Despite the inefficiency of relational norms and social sanctions alone to curb opportunism and conflicts, not all dyadic relationships between buyer and supplier are based on a transactional norm of a written contract. Contracts may add rigidity when unanticipated events occur. Contracts likewise constrain uncontracted obligations of a customer or supplier, and they have limited room to make both individual and joint decisions outside the contract scope. This lack of flexibility may be a significant issue for buyer-supplier relationships in developing markets because unexpected events often occur after the contract is signed (Liu et al., 2009). Exacting contracts may lead to strategic rigidity in a rapidly changing yet attractive growing industry, demotivating or constraining partners' efforts to seek out and benefit from new business prospects (Bernheim and Whinston, 1998). Contrarily, relational norms encourage companies to innovate outside the scope of a contract, providing flexibility, organizational agility and adaptability based on situational needs in unpredictable markets. Firms will be more inclined to embrace developing market possibilities if relational norms are governed (Liu et al., 2009).

Limited contact and negative experiences with supply chain partner, including disloyalty, lack of trust, workforce-related malpractices (whether purposeful or inadvertent), and the absence of joint objectives would undermine a joint decision-making effort (Irani et al., 2017). When a number of implementation difficulties and obstacles are present, including a lack of shared objectives, demand variability, software budget, partner trust, difficulty calculating benefits, executive support obstacles, a lack of real-time information exchange coordination, and a lack of adequate information technology and expertise, all of which resulting in a lack of partner confidence, joint decision-making is consequently hindered (Panahifar et al., 2015).

Cultural differences may also hinder transnational collaborations, for example due to Western individualism and Eastern collectivism cultures leading to different collaborative behaviors and activities, which may exacerbate the joint decision-making process when not carefully addressed (Huang et al., 2020).

Fear of losing competitive information (e.g. financial reports,

manufacturing schedules, inventory values, intellectual property issues, and information sharing by competitors), a lack of technical expertise, and the availability and cost of technology, have been identified as major barriers to collaborative planning implementation (Panahifar et al., 2015).

Lack of a company’s capability to adapt to new changes could also hamper joint decision-making. For example, when creating decisions on new processes and technologies, partnerships are tied to the capacity to adapt and utilize these new platforms, rather than to the gap of understanding of partners in IT processes and structures when the change was requested (Scuotto et al., 2017). The ability to close this gap emerging from a change request will motivate partners to make joint decisions. Another example is that when corporations in developing nations fail to utilize B2B technology to communicate with local and global business partners, it would be a key barrier to the full potential of collaborations leading to lost opportunity to expand new markets (Alsaad et al., 2019).

Asymmetric dependency levels could also prevent companies to make joint decisions. According to Huang et al. (2020), small domestic suppliers who depend on their manufacturers’ expertise and technological advancements rather than exploring innovation themselves may be less preferred to be the partner for joint decision-making. A relationship that is too dependent limits the scope of collaborative actions, resulting in misaligned expectations between the parties. When one party (such as suppliers) is placed in a position of vulnerability, the collaboration becomes transactional, and manufacturers will not benefit enough from making joint decisions in these relationships (Huang et al., 2020).

Self-sufficiency is another driver of individual decision-making. According to Tjemkes et al. (2017), if a company is offered supplemental resources by its partner that do not meet the company’s actual needs or priorities, there is no urgent need to make joint decisions. These supplemental resources could be in the form of economies of scale, market share, manufacturing capability, or offer of financial resources. These additional resources may not be needed by certain collaborators, but they may be helpful for other companies. To generate synergy and exploit diverse strengths, companies need to give complimentary resources that are close to equally valued by each other.

Since supply chain activities involve end-to-end participation of actors in delivering goods and services, it is inevitable to continue making joint decisions with collaborators, relying heavily on another firm to contribute with their best intention within the decision-making process to improve supply chain performance. It is, thus, becoming increasingly important for companies to judge what decisions to make jointly with their collaborators and which ones are better made individually by themselves, depending on the circumstances.

2.3.2. Risks of avoiding joint decision-making

Despite the risks exposing companies when making decisions jointly, avoiding joint decisions may also bear significant costs (Table 6) or have a major detrimental influence on supply chain performance (Panahifar et al., 2015). Companies, for instance those in the technology sector, cannot survive without bearing or suffering from constant costly investment in the areas of new products, processes, and technologies. It would be helpful if they could access the needed resources from partners by way of collaborative efforts in these areas. By having B2B joint decision-making that is knowledge-based, however, tech companies

Table 6
Risks of avoiding joint decision-making.

Risk	References
Reduced supply chain performance, higher cost absorption	Panahifar et al. (2015)
Inability to access resources of partners, higher investment costs, reduced competitiveness due to lack of innovation power and lack of technical assets	Zhang (2014)

may surpass the limitations of conventional collaboration to increase R&D, innovation, and complementary technical assets that could benefit both parties (Zhang, 2014).

Based on a systematic review of 281 articles published in the time period 1994–2020, Nurhayati et al. (2021) discuss the areas of joint decisions identified within supply chain literature. Those are, among others: pricing, sourcing & procurement, replenishment, outsourcing, product, investment, alliance, sustainability, quality, inventory, marketing channel, and supplier selection. Each of these decision requires certain information or knowledge as well as parameters. For example, in pricing decisions, companies would need information of “production costs, raw material costs, and profit margins”, whereas in product decisions, information needed is on “design, size, quality, specifications, lifecycle, range of products, packaging, as well as additional services related to the product” (Nurhayati et al., 2021, p.100). In some circumstances, this information could be poorly available within a company, and when not enriched, could lead to incorrect judgment and misleading insights for decisions. This limitation exposes a need of collaborating with partners who may have input and leverage in knowledge to make these decisions.

2.4. Empirical evidence of joint supply chain decision-making across multiple industries

To provide an enriched view on current practices of joint decision-making, we studied the literature and collected empirical evidence from the following industries: automotive, agribusiness, FMCG retail, as well as high-tech. We discuss the observations below.

2.4.1. Automotive industry

Joint decision-making in the automotive industry is a well-researched topic, providing rich insights on the decision drivers and facilitators. The automotive industry remains a popular topic in B2B relationship studies due to attribute of “technology lock-in” that emerges from prior investments in product designs, infrastructure, economies of scale, process, and value chain. Lockström et al. (2010) studied Chinese automotive industry and captured collaborative efforts and decision-making carried out jointly with suppliers to enhance collective supply chain performance (e.g., cost reduction, quality assurance, delivery reliability). These collaborative forms include collaborative manufacturing, co-development, integrated communication and technology, future planning, and integrated organizational infrastructure (Lockström et al., 2010), all of which requires joint decision-making activities. Lockström et al. (2010) also suggest that these joint efforts are mainly facilitated by process management capability, problem solving skills, capacity for learning, engineering and innovation capabilities, planning skills, as well as systematic performance management.

According to Huang et al. (2020) who also studied the Chinese automotive industry, car manufacturers must often make joint decisions with their suppliers to cut costs without losing quality. To do this, prior to making joint decisions, they choose recognized suppliers who are trusted and who demonstrate goal congruence. However, doing so could be a challenge. Disputes in joint decision-making processes are inevitable, due to occasional misalignment of profit returns, cultural viewpoints, differences in working styles, and power levels. It is argued that Chinese suppliers care more about how soon a new product hits the market, whereas their foreign customers care more about product quality and procedure (Huang et al., 2020).

Another cause for disputes in B2B decision-making is misaligned incentives. Incentive alignment involves sharing costs, risks, and gains (Simatupang and Sridharan, 2005). Yet, not all partners share equally. Huang et al. (2020) reveal asymmetric incentive alignment in their case study, which may create resistance in making joint decisions. Finally, companies are concerned about intellectual property challenges when making joint decisions with their network. Despite intense rivalry,

manufacturers tend to choose low priced suppliers, making it more difficult to safeguard intellectual property and thus create a lack of confidence when making joint decisions and sharing information. Despite this concern, provided there is trust, Huang et al. (2020) stress the importance of joint learning and collaborative knowledge management in minimizing costs and encouraging innovative ideas, which contribute to the development of a competitive advantage.

2.4.2. Agribusiness industry

Peng (2011) provides an empirical study in agribusiness discussing how joint decision-making is governed between companies. According to the findings, contracts are used to regulate how a company conducts business with its important suppliers, but it does not necessarily mean the company will engage with these suppliers in making joint decisions more often. However, suppliers tend to prioritize contractual customers above non-contractual ones, and will use advanced platforms, senior management, and personnel from several departments to engage contractual clients in decision-making (Peng, 2011).

The supply chain in the agri-food industry is distinguished from conventional supply chains by the unique features of food. The actors in this industry generally place a high value on co-creation, adaptability, resilience, control and ownership of their brands (McIntyre et al., 2018). This industry deals with items with a short life cycle, huge volumes and product variety, lengthy production throughput times and seasonality in agricultural output, variable quality, quantity, and processing yields, particular transportation and storage conditions, and variably priced products (Badraoui et al., 2020). According to Badraoui et al. (2020) study, due to these characteristics, trust, interdependency, committed investments, resource sharing, knowledge sharing, goal congruence, incentives alignment, mutual planning, and joint performance measurement are crucial elements necessary in joint decision-making efforts.

Despite the rich discussion on important elements of joint decision-making in the agribusiness literature, there is a lack of focus to make a distinction between drivers, facilitators and barriers (the lack of facilitators), and which elements belong to each category.

2.4.3. FMCG retail industry

Madlberger's (2009) empirical study in FMCG retail reveals that an active information-sharing policy, top-management commitment in strategic information sharing, internal technological preparedness in operational information sharing, and perceived advantages promote information sharing and joint decision-making within B2B collaborative settings. In order to provide a safe space for joint decision-making to flourish, trust needs to be established. Trust is the conviction that a partner will behave ethically and that nothing unexpected would occur that may result in negative outcomes (Anderson and Narus, 1990). When a company provides information, it faces the risk of that data being misused. When the company receives data, it faces the risk that the data is inaccurate and misleading. With trust, partners are compelled to accept some degree of danger freely (Madlberger, 2009). Therefore, trust is understood as an important variable that facilitates joint decision-making.

2.4.4. High-tech industry

Few empirical articles discuss the types of decision-making facilitators needed specifically in this industry, namely ease of access (Middendorp, 2022) and Electronic Data Interchange (EDI) or IT platform integration (de Mattos and Barbin Laurindo, 2015).

Middendorp (2022) provides empirical evidence of both aligned and misaligned resource integration in high-tech B2B value co-creation. It is suggested that misalignment can be caused by either lack of direct human-to-human encounters that could have captured behavioral aspects indicating customer validation, or the use of a complex system as an intermediary during communication (Middendorp, 2022).

According to de Mattos and Barbin Laurindo (2015), sharing

strategic information between high-tech companies may enhance competitive value. This can be done via platforms for B2B that allow parties to exchange contracts, CAD files, and video conferencing. Through platforms like EDI, suppliers can get delivery instructions, partners can design, create, manufacture, organize, and deliver client-specific goods and services in a rapid pace (de Mattos and Barbin Laurindo, 2015). Supply chain visibility allows partners to have access to or transmit meaningful information e.g. accurate descriptive reports and predictive projections necessary as input for joint decision-making.

Despite the mentioned findings, there remains a lack of in-depth discussions with focus on drivers and facilitators of joint decision-making in the high-tech industry. At the same time, high-tech businesses could benefit as they are growing at a rapid pace on a global scale, and their products and services support other industries. With this article, we also aim to invite researchers to investigate the topic even further.

2.5. Conceptual framework

Based on the above prior insights from literature, a conceptual framework is developed (see Fig. 1). Following this framework, this study aims to further explore the dimensions of both drivers and facilitators of joint decision-making within the specific context of dyadic inter-firm relationships between suppliers and manufacturers, particularly in the Dutch high-tech sector.

Further, through case study, we aim to investigate the combinations of drivers and facilitators that is the most and the least common to mobilize joint supply chain decision-making across the Dutch high-tech actors. While being aware of potential risks of joint decision-making, we will maintain consistency with defined scope and keep the notion of risks to be discussed in-depth in future studies.

3. Methodology: multiple case study

This study is empirical and descriptive in nature, with interest in distinguishing how certain drivers and facilitators complement each other and influence decision-making structures. As outlined above, existing concepts and approaches in literature were used to help with the study design and analysis. A multiple case study approach is the strategy chosen to conduct this study.

3.1. Selection of cases

To optimize and deepen our learning, we collected a number of examples on which to base future claims and analysis. According to Halinen and Törnroos, 2005, a case method is ideal for the study of corporate networks and their current phenomena. The unit of analysis in the case study technique does not correspond to a sampling unit and is not picked at random as in statistical methods (Yin, 1989). Multiple case studies, according to Yin (2003), may be used to "(a) forecast comparable outcomes (a literal replication) or (b) predict opposing results but for predictable reasons (a theoretical replication)" (p. 47). Theoretical sampling is used to pick examples in a controlled manner (Ragin, 1987; Yin, 1989). Boundaries are necessary in structuring the case study in order to address a particular topic without becoming too wide (Stake, 1995; Yin, 2003). A case may be built to guarantee that it works within a reasonable scope by binding it by definition and context (Miles and Huberman, 1994).

In this study, the cases are chosen based on the following criteria: (1) company size, which is determined by the turnover and number of workers; (2) combination of positions in supply chain: upstream or downstream; and (3) collaboration type. The fundamental rationale for the three criteria is to gain a general overview of all cases, and is based on the following considerations:

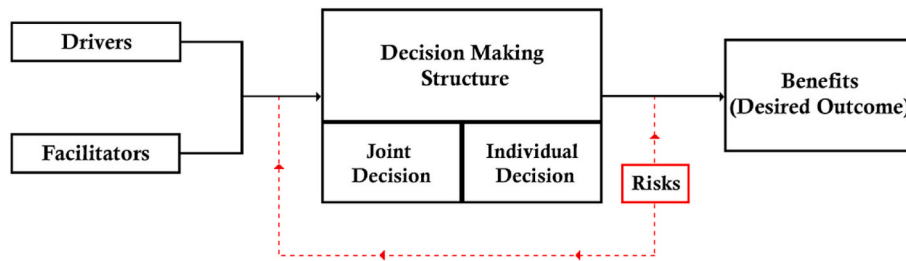


Fig. 1. Conceptual framework, extended version.

- **Company attributes:** We noted the attribute of each case's turnover, status of public vs. privately held, number of employees, and years of establishment to avoid uniformity of responses, and to account for the likelihood that certain company attribute might impact joint decision-making behavior and tendencies of commitment in the relationship. For instance, one may argue that smaller firms may be more driven by the need to expand market compared to their long established, capital intensive, larger counterparts. One may also argue that in order to protect profit margin, firms with lower turnover may avoid sharing trade information and thus avoiding them to make joint decisions with larger counterparts, although the likelihood may also be similar among firms with larger turnover. We aimed to have a mix of companies with diverse attributes to generate a conclusion applicable to all. When we began to see saturation of cases with similar categories of attributes, we refrained to collect similar ones. We sent specific requests to respondents to cover for cases with other attributes in order to diversify the cases. To conserve space, however, this study does not discuss the distinctions between joint decision-making drivers nor facilitators relative to each company attribute in this article.
- **Combination of position:** In this study, the position indicates whether an actor is upstream (supplier) or downstream (manufacturer) in their supply chain. To account for and avoid possibilities of uniformity of responses, we aimed to be close to a balanced mix of several combinations: positioning focal company as a supplier, and focal company as a buyer (manufacturer) within its supply chain. This attempt is done to avoid only gaining a narrow subset of "mostly suppliers" or "mostly buyer (manufacturers)" that might not represent the whole population.
- **Collaboration type:** We included cases that satisfy the requirements of Lambert et al. (1996) notion of 'partnership', which is the type of collaboration that falls in between the two extremes of arm's length and fully integrated supply chain. According to Lambert, there are three distinct forms of partnership. This involves any relationship with the following characteristics:
 - Type I: cooperative understanding, short-term contract, repeated transactions, product life partnership, purchase option;
 - Type II: long-term projection of contract, shared goal, orientation to cross-functional effectiveness; and
 - Type III: strategic alliances and the Just-in-Time perspective.

To conserve space, this study does not discuss the specificity of each case based on these three partnership types. Rather, we used this as frame reference and guide when including and excluding the cases.

3.1.1. Case exclusion criteria

Given the scope of this paper, this study focuses on the collaborative process of decision-making and the interconnectedness of interdependent manufacturers and suppliers. This research does not include relationship contexts that fall under arrangements of joint ventures, horizontal connections or competitions, arm's length relationships, or vertically integrated supply chains. The latter refers to an arrangement where some or all parts of a company's supply chain is owned by another

company for control and streamlining purposes, thereby allowing not much room to make individual decisions. We only investigate decisions involved in a dyadic relationship or bilateral form of inter-firm collaborations in a partnership level where both joint decisions and individual decisions are allowed to appear more symmetrically. We assume that these relationships consist of companies that have greater freedom and less restrictive arrangements in directing their supply chain strategies.

A case is considered qualified when the interviewee is willing to discuss a B2B supplier, a B2B customer or both. Initially, we reached out to respondents from 12 companies, aiming to have 24 cases. However, during some of the interviews, we found out at a later stage that some companies are not directly connected with their B2B product users, meaning that they work with a middleman company, such as a distributor, a trader, or a retailer. To ease the data analysis, we decided to exclude their relationships with those type of companies and include only relationships where there is direct interaction with users of materials or products, which could be between supplier and manufacturer alone, where the downstream actor (manufacturer) is the user of its upstream counterpart (supplier). With this exclusion, we ended up with a total of 13 supplier roles and 9 buyer (manufacturer) roles across dyadic relationships (see Table 7).

3.2. Data collection

We limited our target population into Dutch high-tech manufacturers with operating offices in the Netherlands. The focal companies selected in this study are located in the Dutch tech hubs such as Delft, Eindhoven and Amsterdam. This narrowed selection is aimed to provide location proximity and thus ease of interview process, so that interviews could be done face-to-face by the researcher and respondents. By doing so, it is expected that respondents would be more comfortable to share their insights. We specifically limited our criteria of respondents. They work across various departments within supply chain scope, ranging from sourcing, planning, procurement, logistics, supplier relationship and performance management, who are at middle or senior management roles in the company, and are in direct interaction with their supplier and buyer (manufacturing companies) in their current role. To ensure minimum levels of topic expertise and familiarity, we invited those respondents who had graduated from universities with at least a Bachelor degree, had a minimum of eight years of professional experience, and had a minimum of one year of interaction with buyer and supplier.

3.2.1. Contacting respondents

We used LinkedIn Premium advanced search database to contact the company representatives via the researcher's LinkedIn account. We communicated our invitation to interview, providing general idea on the research topic. Due to limited number of contacts available in the platform that fulfil our criteria, compounded with a slow rate of connection request acceptance and positive replies, we decided that one representative from each focal company would be sufficient for this study in order to conserve time. The names of the companies, as well as representatives, have remained confidential throughout this study.

Table 7
List of high-tech companies interviewed^a.

Company	Case number	Which partner is discussed	Total years of establishment	Status	Total employees	Description
A1	C1	Supplier	31–35	Public	10,001+	The company provides industrial clients with solutions in Electrification, Process Automation, Motion, Robotics and Discrete Automation.
A2	C2 C3 C4	Buyer Supplier Buyer	6–10	Privately Held	11–50	The company is a university spin-off and provides expertise in nanoparticle manufacturing and integration. Their technology helps companies develop faster by generating nanoparticles on-site and integrating them directly into the final product. Applications includes sensor, battery, catalysis, solar cell, healthcare, additive manufacturing, and nano safety.
A3	C5 C6	Supplier Buyer	66–70	Privately Held	501-1000	The company creates and enhances components, modules, and systems. It also provides supply chain management, milling, and sheet metal manufacturing. Industry and health-tech industries are served by the company.
A4	C7 C8	Supplier Buyer	51–55	Public	1001–5000	The company specializes in the design, development, assembly, and maintenance of high-level functional modules and subsystems. It produces high-mix, low-volume electrical components for worldwide Original Equipment Manufacturers.
A5	C9 C10	Supplier Buyer	51–55	Public	1001–5000	The company offers solutions for product lifecycle management of sophisticated electronic applications as an international one-stop-shop provider in the Electronic Manufacturing Services (EMS) sector, for electrical components, assemblies, and operating systems (box builds). Also, they offer customized solutions for PCBA's, cables, microelectronics and box construction applications, always striving for the lowest total cost of ownership.
A6	C11 C12	Supplier Buyer	36–40	Public	10,001+	The company is a significant global supplier of lithography equipment for the semiconductor industry, producing complicated machinery required to manufacture integrated circuits or microchips.
A7	C13 C14	Supplier Supplier	71–75	Privately Held	1001–5000	The company provides farmers with innovative solutions and personalized services for every cowshed task, from milking to cleaning. The company advises on how to operate a dairy farm efficiently using management systems.
A8	C15 C16	Supplier Buyer	21–25	Privately Held	501-1000	The company is a technology partner that specializes in the development and manufacture of technical goods and solutions. Clients hire their specialists in the areas of Technical Software, Mechatronics, Electronics, Mathware, and Assembly to augment the expertise or outsource projects. The company can assist with research and development or perhaps take on the role of the R&D and production departments.
A9	C17	Supplier	>100	Public	10,001+	The company delivers integrated solutions using innovative technologies and clinical and consumer data. In addition to diagnostic imaging, the firm is a pioneer in consumer health and home care.
A10	C18 C19	Supplier Buyer	51–55	Public	1001–5000	The company is a global one-stop provider of Electronic Manufacturing Services (EMS), and proclaims as a market leader in: Automotive, Medical, Industrial, and Semiconductor. They provide tailored solutions for the entire product life cycle (from concept to after-sales support) of electrical components and complete (box-built) electronic control systems.
A11	C20	Supplier	36–40	Public	201–500	The company is leader in making highly automated beverage machine in-house for consumer and professional buyers. They focus on providing superior solutions for Office, Hotel, Restaurant, and Automatic Vending locations. They conduct their own R&D and in-house manufacturing. Initially a private company, they were acquired by a larger stakeholder to cater bigger market and became one subsidiary.
A12	C21 C22	Supplier Buyer	11–15	Public	10,001+	The company is one of global pioneers in secure embedded connection solutions for the automotive, industrial, IoT, mobile, and communication equipment industries.

^a Note: information retrieved as of October 2021, sources: LinkedIn and corresponding company websites.

3.2.2. Interview questions

To collect data, semi-structured interviews were conducted. Based on the insights derived from the literature, we prepared the questions (see Appendix 1). We asked each interviewee to think of one B2B supplier and one B2B customer, if any, and describe their company's relationships with these companies. We focus on the decision-making process and repeat transactions between focal companies and direct collaborators upstream and downstream. Each interview lasted between 60 and 90 min and was conducted once *per* interviewee, with occasional follow-up questions for some of the cases when further clarification was necessary.

To mitigate potential response bias, we ensured that each question posed to respondents was accompanied by correct probing and definitions necessary to achieve comprehension and consistency in the data depth of each case. We also asked the respondents to provide examples in their own words to infer the validity of their responses later and avoid incorrect assumptions. All respondents could provide answers consistent with predefined terminologies. Further, early and late interviews of

cases with similar categories (company size and company position) were compared to mitigate response bias. There were no significant differences between early and late interviewees in terms of respondent's knowledge or familiarity of the chosen suppliers or manufacturers. The concept of familiarity was borrowed from EM Saenz et al. (2014), whereby respondents were asked to claim their familiarity in making joint decisions with their chosen suppliers or manufacturers, and to select only the ones with which they have had professional interactions over a period of at least one year.

3.3. Data analysis

We worked with recorded and transcribed interviews data gathered from 22 cases (dyads), which were then labelled and analyzed with content and thematic analysis.

To manage and analyze the data, we used NVivo™, which is widely used qualitative data analysis software, to aid in finding and retrieving relevant comments including key phrases from respondents. We

developed the analysis plan based on the labeling (or coding) procedures of Woods et al. (2016) using the same software with some adjustments as below:

- Step 1: We used NVivo™ speech-to-text feature to automatically transcribe the interview sound recordings and proceeded with additional checks and manual corrections for several machine-translated mistakes. The translated documents are stored in rich-text format.
- Step 2: The researcher executed the coding via a mix of search queries and manual sorting. Using the existing literature as a foundation (Bandara, 2006; Yin, 2009), we created an indexing system of data categories called nodes in NVivo™ based on the list of drivers and facilitators of joint decision-making that the researcher could code into (Table 8).
- Step 3: The finished nodes system exhibited the full categories or themes of identified examples, a quantitative count of the number of examples in each node, the corresponding case number where the examples belong to, and the content for each item coded to the node when it was accessed. Based on the finished nodes, we made an observation to ensure consistency or match between examples and each theme and to determine the rigor and the occurrence of similar examples found across cases.
- Step 4: Finally, we used NVivo™ to execute a matrix coding query to find the co-occurrences of drivers and facilitators in each case.

We discuss the results thematically through critical reflections to infer associations between drivers and facilitators of joint decision-making. Finally, we explored the study implications for theory and practice.

4. Results

4.1. Drivers of joint decision-making

To explore the motivation behind collaborative or joint decision-making, we asked the respondents the following questions:

- *What motivates you to make joint decisions with your collaborator?*
- *What kind of supply chain decisions are usually made jointly with your collaborator?*

Based on the interview responses, we found seven main drivers. Below we briefly discuss the drivers (Table 9).

4.1.1. To access and grow new market

There are tendencies from the respondents to conclude joint decisions to either open access to a new market or create a better position in the market competition. In C10, the respondent indicated its willingness to grow together with its client, even though it is still a new startup company, in the aim of tapping a new market. The company claimed to look forward to reaping higher revenue (C21).

Table 8
List of codes.

Drivers	Facilitators
D1: To access resources & capacity	F1: Transaction history
D2: To adapt to market developments/maintain client base	F2: Ease of access
D3: To align financial incentives	F3: ERP/EDI systems
D4: To share risks	F4: Established contract
D5: To access new market	F5: Location proximity
D6: To incite more commitment from collaborator	F6: Trust and openness
D7: To reach target cost	

Table 9
Identified drivers of joint decision-making.

Drivers of joint decision-making	Cases (C) occurrences
To access/grow new market	C10, C21
To adapt to market developments/flexibility/maintain client base	C1, C2, C7, C8, C10, C13, C18, C22, C19, C21
To access resources/capacity/assets of the collaborator	C3, C4, C5, C7, C8, C11, C13, C14, C17, C18, C21
To share risks with collaborator	C7, C8, C12, C21
To incite more commitment from collaborator	C9, C10, C11, C17
To align financial incentives with collaborator	C1, C3, C6, C14, C20, C22
To reach target cost	C15, C16

4.1.2. To adapt to market developments, flexibility, and changes in client base

In another case (C21), the respondent also highlighted the importance of establishing joint decisions with the supplier to gain a better position in the market competition. Respondent in C1 claimed that joint decision-making is needed when there is a market corresponding to it: *“(with supplier), it is a discussion we are having: is it based on an order, yes or no? If not, is there a market?”* Respondent in C13 also signified the importance of co-development with its supplier to expand the market. Respondent also intended to make joint decisions as a mechanism to maintain their relationship with the client (C22): *“(we make joint decisions) because of the sheer volume they have at our site.”* Similarly, another respondent also claimed to use joint decision-making as a way to adapt to their partner (C19): *“For quality reasons then you will have more lines managed through joint decisions or proposal. If the customers want better quality product, then they will sometimes invest in it.”*

4.1.3. To access resources, capacity, or assets of the collaborator

From the interviews, we also identified another driver of joint decision-making, which is the ambition to control risk and resources. Respondents claimed to be willing to establish joint decisions with their suppliers considering the capacity of their suppliers in producing complex parts (C13). Reliability of their supplier to produce the correct quantity at the right time is another consideration for developing joint decisions (C14). The importance of collaborators’ capacity to perform is paramount to respondents because if the suppliers failed to deliver, the respondents would also face the consequences (C17). The suppliers’ ability to deliver certain quality is also determinant in establishing joint decisions (C18). Sometimes, in facing customized orders, it is vital to involve the suppliers in the decision-making process to ensure that they can produce the customized orders (C4).

4.1.4. To share risks with collaborator

Sharing the risk is another driver for establishing joint decisions with the suppliers. In facing the dynamic market, it is sometimes better to create a joint decision with suppliers to share the risk of market changes (C12).

4.1.5. To incite more commitment from collaborator

Establishing joint decisions could also be driven by encouraging suppliers to commit. In pricing, for instance, it is essential to gain commitment from the suppliers (C9). If the supplier is still in the startup stage, it is also important to incite their commitment to growing into a specific market direction (C10). By having a joint decision and involving the suppliers in the decision-making process, respondents aim to gain more substantial commitment from their suppliers (C11).

4.1.6. To align financial incentives with collaborator

Involving suppliers into a joint decision-making process could also be driven by financial motives. In C22, a respondent said, *“they are so important to us. We will do anything for them. They will give us a regular update of their forecast and the value of those numbers are unreliable. So, we have a separate organization that finalizes the demand and makes the*

decision of what real demand is.” Similarly, the respondent from C1 argued that “mostly it is financial motivation. We are buying and selling products and services. This is the basics. You need to earn money.”

4.1.7. To reach target cost

By having the suppliers involved in the decision-making process, the agreed production cost could be optimized due to their better knowledge of their field. Even if the cost would go higher than what was agreed upon in the contract, the respondents tend to be safer. The respondents could place the cost burden solely upon the suppliers’ risk because the suppliers have been involved in the decision-making process in the first place (C15). Having the suppliers involved in the decision-making process would also lead to cost efficiency (C16).

Based on the abovementioned responses, we find that two sets of drivers are dominant, based on the frequency of appearance among the seven drivers identified. First, companies make joint decisions to access their collaborator’s resources, capacity, and assets (11 cases). Second, companies make joint decisions with their collaborator to adapt to market developments, adjust flexibility, and eventually maintain a client base (10 cases).

4.2. Drivers of making individual decisions

Other than making joint decisions, respondents may equally have specific drivers not to involve another partner in their decision-making. To explore the motivation behind an individual or autonomous decision-making, we asked the respondents the following questions:

- In which circumstances do you find the lack of need to make joint decisions with your partners?
- What kind of decisions are better made individually by your company without involving your partner?

We could group the drivers into seven categories (See Table 10 and the explanations below).

4.2.1. Protection of profit margin

Respondents preferred to establish individual decision-making mainly to protect their profit. In this type of scenario, for instance, in the case of pricing, respondents have their internal policy and calculation of pricing and profit estimation. Therefore, the suppliers only serve to help the respondents as manufacturers calculate pricing and answer RFQ from their customers (C21). The manufacturers tend to hold the lead regarding profit/margin protection (C13). In this driver category, the suppliers play a role in determining the best price for parts production separately.

Nevertheless, the final pricing decision and profit/margin calculation would be determined solely by the manufacturers (C3). It is done based on the protection of commercial interest, which will prevent parties to be open for joint decision-making. In C7, the respondent

signified, “but on the other hand, it is also in their commercial interests to disclose everything.” Furthermore, the respondent in C7 emphasizes that, “but, you need to convince them that our goal is not to eat their margins. Instead, I want to have an open culture where we can reduce costs or at least remain relevant.”.

4.2.2. Self-sufficient in information

Respondents claimed to be reluctant to establish joint decision-making with suppliers if they deemed themselves sufficient in terms of information. If the manufacturers are already sufficient with important factors such as pricing strategy, quality, cycle time, reliability and capacity support, individual decision-making tends to be a preferable route (C21). Quoted among some examples from the respondents, such as in C22, “so that is our own decision to say this. OK, we understand is your input, but we do not think that is correct.” In C4, respondent claimed, “either small decisions or decisions that do not affect the functionality or the price, are individually done. Moreover, it does not matter for our clients if we use different internal electrical components. As long as they do not have to pay for it. Alternatively, it changes the product.” Similarly, individual decision-making is observed within C19, as a respondent added, “sometimes we think we have a better understanding in one area than the customer, so we take care of it ourselves.”

4.2.3. Process simplification

If individual decision-making leads to a simpler process, respondents prefer to have it. In product development, for instance, the respondents perceived that it was simpler to let the suppliers decide the production process without any joint decision-making process with the manufacturers. Even though the communication is limited at a broader level, when it comes to product development plans, the execution is placed solely upon the suppliers (C13). As the respondent’s supplier held superior knowledge in making certain parts, the respondent avoided being involved in joint decision-making to simplify the process. Instead of being entangled in inconclusive discussions, the respondent in C7 preferred to let an individual decision to be made by their supplier. In C7, the respondent emphasized that “If he is so heavily involved in the whole process and he also knows I have no option, then it is tough to talk about the price.” For another decision problem, the respondent in C17 argued: “Transport is not always a joint decision. We can discuss about transport and packaging, but they are free to choose as long as it is within the budget, it is a long-term solution, and it will not interfere with our product development.”

4.2.4. Intellectual property (IP) protection

Legal liability is also another driver category that can lead to individual decision-making. If any elements in decision-making lead to a violation of IP rights of either respondent, as manufacturer or supplier, this would be a determining factor in favor of an individual decision, especially when the respondent is a technological company with a lot of protected knowledge. Individual decision-making turns out to be the most favorable option for this scenario (C14).

In the product development section, the respondents tended to avoid being involved in joint decision-making simply to avoid legal consequences in changing a particular protected design. In C8, the respondent explained that “For them (the suppliers), it is a finished product. They work with building blocks. If the engineering phase is finished, they move on.” Moreover, protection of IP rights becomes of utmost importance for some respondents. Prudent secrecy is employed when it comes to protecting technical know-how and other IP related issues. The respondent in C9 expressed that “looking from the pro-choice side, we always want to make secured decisions on where to buy what materials. It is not good to involve them (the partner) in this decision.” Such secrecy placed on IP rights-related matters would prevent the respondent from sharing any possibility of making joint decisions with their counterparts. This concept also works on the supplier side where the suppliers own the IP rights. In that regard, despite the communication still being maintained

Table 10
Identified drivers of individual decision-making.

Drivers of individual decision-making	Cases (C) occurrences
To protect profitability/margin	C21, C7, C2, C13, C3
Having enough information already	C21, C22, C4, C17, C19
To simplify the process (e.g. to shorten feedback loop in design process)	C7, C13, C17
Protecting intellectual property (e.g. design already decided, technical information from manufacturer)	C8, C9, C14
To maintain quality	C10, C11
To save time	C6, C3
Incapability of collaborator to commit in joint decision-making	C2

with the manufacturers, the suppliers would prefer to have individual decision-making regarding their IP rights protection.

4.2.5. Preserving quality

Joint decision-making would also be avoided by respondents when it comes to quality preservation. If a joint decision would compromise or in any way alter production standards, the parties involved in the decision-making process would prefer to make it an individual one. In C10, the respondent highlighted that "... it is hard to say, but it (negotiation) happens in the middle because in the end, they have to follow our production standards and the rules within a company if they board with us. Similarly, however, we also have to respect their product and materials." In another case, C11, the respondent suggested that "the deliveries have to meet (our standard of) ninety-eight per cent, always on time, in full. There is no (room for) consensus." Such respect for product and materials standards would lead to an autonomous decision.

4.2.6. Timesaving

The respondents would also avoid joint decision making if such options cost them too much time to discuss and negotiate. If the option to share information to make joint decision-making would only lead to a longer time of coordination and discussion amongst the actors, individual decision-making would be preferable (C3). Respondent in C6 also emphasized that "And if they do not agree, they can escalate the fight themselves. Furthermore, I know what the end is. It is time-consuming." In this type of situation, the respondent would avoid prolonged discussion in the light of time preservation.

4.2.7. Capabilities of collaborators

In C2, the respondent indicated that there are moments when their buyer is "not sure with our package, possibly due to their limited capability in managing a high risk and high-cost offer, therefore they are not ready to commit in a joint decision-making with us". In such cases, the company sees better value in making individual decisions such as pricing and other transactional-level decisions that exclude strategic ones.

4.3. Facilitators in joint decision-making

To explore the facilitators that enable joint decision-making, we asked the respondents the following question:

- What facilitates your joint decision-making process with your partners?

In making joint decisions, there are also several categories of facilitators that would lead the actors in the decision-making process to submit themselves into it (please see Table 11 and the following discussion).

4.3.1. Ease of access

Across our interviews, we find that the most common factor that can facilitate the actors to establish joint decision-making is to create an ease of access amongst them. By having ease of access and sharing the knowledge, for instance, business forecasts, the actors could enjoy better joint decision-making (C14). Sharing specific access to knowledge

Table 11
Identified facilitators in joint decision-making.

Facilitators in joint decision-making	Cases (C) occurrences
Ease of access (e.g. personal contact, good personal communication, social commonalities)	C21, C9, C10, C1, C3, C19, C4, C14
ERP/EDI systems	C21, C3, C19, C14, C18
Established contract, agreements	C10, C6, C15, C13, C22, C3
Location proximity	C7, C4, C3
Transaction history	C21, C7, C8, C11, C12, C19, C16, C17, C20
Trust and openness	C21, C5, C1

would also be another facilitator to pave ways to a better market in the future (C9). Accessing a bigger market in the future would be a promising driver, especially for smaller startup tech firms. Therefore, ease of access between collaborators is highly needed to support this purpose (C10). Sharing access to gain better potential growth would be very beneficial to drive parties in the decision-making process to make a common ground together (C21).

Seamless joint decision-making could also be the actors' goal, thus having ease of communication would be preferable for them (C19). In some cases, smaller technological firms would benefit from having easy access to establish joint decision-making because otherwise, they can be easy to be denied by the more prominent company due to a particular gap of company size/scale (C3).

Some companies find it challenging to reach out to specific customers when there is no ease of access. Thus, it is worth investing in building ease of access, mainly in the beginning of collaborations. In C4, for example, the respondent explained, "...but I cannot directly talk to them (the Chinese customers). It is not easy in terms of language and culture and everything. So, I interface with our distributor, and they communicate the message to the customer." In another case, C1, the respondent highlighted that "you have to establish some personal contact at least. Communication is usually more open after the first time. After a couple of years, you start treating them almost like you work with somebody sitting next to you."

4.3.2. ERP/EDI systems

We find that by sharing a forecasting platform (C14) or a shared supervision system amongst them (C3), actors could share crucial information that would shape their joint decision upon some issues. A commonly used system would make a seamless production flow between the suppliers and manufacturers in producing the end product (C19). In C19, the respondent said "you add (the demand forecast) in the enterprise planning system to send a request to the supplier. That creates purchase requisitions, so suppliers can start procuring these items." Respondents sometimes even have several commonly used apps to run certain products (C21). By sharing such information via shared apps, the respondent explained that they can make more joint decisions based on real-time data, leading to optimization of resources, as respondent said "(...) we have multiple apps that can run the status of a certain product, that will make the decision how much we are on at this factory and then the other factory."

In C18, it was also highlighted that a good configuration of information management interfaces is key to an optimized operation, "They have good tooling to handle our demand. They have proper system software, and they have good procedures. They have the same structure as we have with our customer and is aligned with our customer requirements."

4.3.3. Established contract or agreement

We find that an established contract could also be another facilitator to establish joint decision-making. If the contract has been established for specific agreed terms/years (C15), the actors would feel much more comfortable establishing specific joint decision-making processes upon the contract's agreed section. By having a contractual relationship, the respondent would tend to have joint decisions to honor the contractual obligations they have made together. In C6 the respondent said "If you start in the beginning (the contract), you will keep it up to until the end. Changing can happen in between, yet it doesn't happen often."

Contractual relationships could also benefit smaller firms and motivate them to join joint decision-making. When a contract could support legal certainty for certain situations such as inability to deliver upon agreed matters with the manufacturers, smaller firms would find it better to have a contract to solve this situation, thus making them more comfortable in a joint decision scheme. The respondent in C10 said that "if it is a crucial decision, for example, that they are going to shift their production to another company when we still have leftovers or running production, in that case, we already have good agreements how they should deal with us". A contract can also potentially increase the attractiveness of suppliers, as indicated by C13: "yes, we could switch, swap, switch to other

suppliers. Nevertheless, this particular supplier is crucial for us. It is our long-term contract supplier also. So, you find that those things (joint decision-making) go more smoothly than you expect.”

4.3.4. Location proximity

If the actors are located within a certain distance, it would be more convenient for them to have a joint decision-making process due to more accessible communications and to make physical follow-ups. The communication options are comprehensive primarily when the manufacturers and suppliers are located in the same tech-complex or industrial area (C3 and C4). It could be done by either having a simple phone call or more formal physical meetings to decide specific issues together. Closer proximity would also make the parties involved feel more comfortable in maintaining joint decision-making. In C7, the respondent explained that “for auto suppliers, it is sometimes also regionally based. This is the legacy that has been around for many years. I have got a close connection also sometimes directly with our customer.”

4.3.5. Transaction history

Having had prior communication or transactions would also enhance the tendency of making joint decision-making together. Knowing the history and track records of the business partners (both manufacturers and suppliers) better would facilitate the actors to establish joint decision making (C16). Transaction history would also guarantee, in a way, the capability of the business partner. In C7, the respondent highlighted that “so they developed it with us and that over the years I think the relationship, which now dates back around 10 to 12 years or something like that, has evolved and proved them to be a reliable partner.”

Having a solid, long-standing relationship would also lead parties to have a joint decision with their business partners. In C11, the respondents emphasized the importance of long-standing relationships by saying, “what I understand is that you have to build a relationship, not a transactional short term, but something for the mid-long-term horizon like 18 years.” A long transaction history would also, in a certain way, guarantee the capability of the counterparty, thus making the respondent feel more comfortable with making a joint decision even if it means paying a higher price for the already known business partners (C19). By knowing the business partners well, the respondent claimed to share information to decide specific issues through a commonly used system (C21). In C17, it is highlighted that a long-standing relationship allows both parties to reap mutual benefits of business continuity and growth, as respondent said “depending on past performance, you keep them long term on board. So, you will have close contact with them. That means that you have a business meeting every few months with them. You typically discuss the progress on the yields, on the portfolios, on the demands. You will look at their technology, their next steps, what they think they will develop. That will help you somewhere and you will typically have a discussion with them or next projects.” Additionally, in C20, it was highlighted that a long-standing relationship creates a lock-in situation that suppliers can leverage towards customers, as respondent said “we need them (the supplier) and we are now more than 35 per cent of the turnover of that particular company. It is difficult to get a supplier that can deliver the same quality for the same cost as they do.”

4.3.6. Trust and openness

We found that having a certain level of trust and openness would also facilitate parties to conduct joint decision-making. If a company already has a shared information platform and a long-standing history with its client, joint decision-making would be preferable. In C21, the respondent emphasized that “I also trust them. If I say we need this and they say they cannot do it, then they really cannot do it.” This response shows the level of trust that accompanies the joint decision-making of the respondent together with its client. With trust and openness, it seems that the threshold for error can be modified to be higher. However, both parties remain accountable to their decisions. As indicated in C5, “if there is open communication, we understand and do cooperate. However,

they (the supplier) also need to acknowledge when they make a mistake.” Similarly, in C1, it was indicated that joint decision-making is preferable in the presence of openness: “You can be very open with them.”

4.4. Barriers to joint decision-making

To explore the barriers that hinder joint decision-making, we asked the respondents the following questions:

- Have you ever wanted to make a joint decision, but found out this is impossible?
- What are the challenges in making joint decision-making?
- What kind of decisions are better made jointly involving your partner, yet you have little access to do so?

The barriers to joint decision-making refer to the lack of facilitators for companies to make joint decisions (even when their partners are willing to make joint decisions too) thus making the decision done individually. We find several categories of barriers (see Table 12 and the following discussion).

4.4.1. Intellectual property rights

The exclusive nature of intellectual property law would prevent one party from sharing or making decisions together, despite their willingness to do so. The respondents sometimes are reluctant to dictate the business partner when it comes to product design protected by IP rights. In C8, the respondent highlighted that “We never decide on such design. The only thing is what we do with it. We make recommendations on how we can make it a better design. So, replacing a component or changing a bit layer where they do not question much on that, that can be indeed sometimes a good alternative.” Any related development on related IP rights issues would prevent the actor from establishing joint decision-making, leading to an inevitable sole R&D and product development.

4.4.2. Different goals/interest

If the parties have differences in their goals/core interests, it will impede their ability to establish joint decision-making. In C9, the respondent signified that “Sometimes we have different goals, different benefits. What do we want? Well, we differ in what we want to benefit from. Then it is not always easy to communicate with each other.”

4.4.3. Lack of internal coordination and alignment in own company

Internal factors within a company could also hinder establishing joint decision-making. In C10, the respondent highlighted dissatisfaction towards the internal communication system, thus limiting the chances to conduct joint decision-making with business partners. The respondent explained “I wish there could be more alignment between the customer towards all the stakeholders within the company so that when an RFP was being sent out, we know what we offer.”

4.4.4. Limited budget and time

Limited budget and time to develop joint decision-making would also hinder the actors’ ability to cooperate in such a scheme, regardless of their willingness, especially for a small tech firm that has already been

Table 12
Identified barriers in joint decision-making.

Barriers in joint decision-making	Cases (C) occurrences
Intellectual Property rights	C8
Different goals/interest	C9, C1
Lack of internal coordination and alignment in own company (between departments, e.g. when commenting on RFQ)	C10
Limited budget & time (having to stick with less developed design)	C6, C3, C4, C19
Collaborator not ready to commit and fulfill the request yet	C2, C3, C22

overwhelmed by many tasks, thus hindering their abilities to develop joint decision-making with their business partners (C3). The respondent will also avoid further discussion about specific requests or suggestions on design changes, if the budget is not there to accommodate such changes. In C6, the respondent highlighted that “sometimes you can judge that the design offered is not always optimal, and there is no budget or resource available to afford a change.” In another case, C4, respondent indicated that a different priority setting could hamper joint decision-making as well “sometimes we want to define the technical specifications, but they do not see the priority. So they deny it because they do not have time.” Similarly, C19 indicated that proposing a cost increase could make another party to withdraw entirely from joint decision-making “so the customer says, no, I am not willing to support that decision because then we have some extra design cost.”

4.4.5. Collaborators are not ready to commit and fulfil the request

A similar scenario would also apply for small firms with other priorities on their task and lack of resource deployment, thus preventing them from focusing on joint decision-making due to their scale of business (C3). In another case, dealing with a reluctant, more prominent firm can also be a barrier, and one can feel helpless because it is challenging to engage them and incite their commitment, as indicated by C22 “they should be honest, they need to give us the full story, in the same way that we are doing to our foundries. That (to share more information) is what we expect from them. Otherwise, we are trying to shoot in the dark.”

Other than the cases mentioned above, the rest of the cases claimed that they never had any considerable difficulties making joint decision-making with collaborators.

5. Discussion

5.1. Asymmetries between suppliers and buyers

Based on the comparison, there seem to be imbalances of examples given by respondents between the discussion about their supplier vs. their buyer. This imbalance might indicate asymmetrical knowledge about one of the spoken partners despite respondents indicating they have sufficient knowledge about both partners. Linking Fig. 2 to Table 7, it is found that the highest asymmetry is found in C21–C22 (respondent of company A12), in C9–C10 (A5), in C3–C4 (A2), in C7–C8 (A4), and in C1–C2 (A1).

Among these imbalances, it is also found that majority of respondents provide more examples when discussing about their suppliers. This could be due to respondents’ role in the companies who work in supply chain department and interact more closely with their suppliers compared to with buyers. Some respondents also have mentioned that marketing, sales, and customer support departments have more interaction with buyers compared to supply chain department. This may also explain why there could be a lack of knowledge or conviction when

discussing buyers.

Further, when making joint decisions with buyers, respondents from the focal company seem to be facilitated more by F4 (established contract), F2 (ease of access), and F3 (ERP/EDI systems) compared to other types of facilitators (Fig. 3).

When making joint decisions with suppliers, respondents from the focal company seem to be facilitated more by F1 (transaction history), F2 (ease of access), and F3 (ERP/EDI systems) compared to other types of facilitators.

When making joint decisions with buyers, respondents from the focal company seem to be driven the most by D2 (To adapt to market developments/maintain client base) compared to other types of facilitators (Fig. 4).

When making joint decisions with suppliers, respondents from the focal company seem to be driven more by D1, D2, and D3 compared to other types of facilitators (D1: To access resources & capacity, D2: To adapt to market developments/maintain client base, D3: To align financial incentives).

In addition, there are a few other interesting observations across the case study. First, the need to reach target cost (D7) does not significantly motivate firms to make joint decisions as much as other drivers. Second, while trust and openness (F6) theoretically enable joint decision-making, these qualities still lack presence or were not mentioned frequently compared to other facilitators. Third, as firms operate more globally, they are learning to get used to collaborating through digital platforms, thus relying less on location proximity (F5) to facilitate joint decision-making.

5.2. Co-occurrence of drivers and facilitators for joint decision-making

In this section, we put the drivers and facilitators of joint decision-making in a matrix to gain insights on their co-occurrence (see Table 13). The top left corner, highlighted in red, indicates the co-occurrence with the highest number of examples found across cases.

According to Table 13, we find that the two most frequent drivers of making a joint decision are the need to access resources & capacity of another firm (19 cases) and the need to adapt to market developments/maintain a client base (17 cases). In contrast, the two most frequent facilitators or enablers in making a joint decision are transaction history (18 cases) and ease of access (17 cases).

We also find that most joint decisions happen when there are co-occurrences of drivers and facilitators: i) between the need to access resources/capacity and the availability of transaction history (5 cases), ERP/EDI systems (4 cases), and ease of access (4 cases); ii) between the need to adapt to market developments/maintain a client base and the availability of transaction history (4 cases), established contract (4 cases), and ease of access (4 cases); and iii) between the need to share risk and the availability of transaction history (4 cases). The respondents indicate a positive correlation between the presence of driver-facilitator

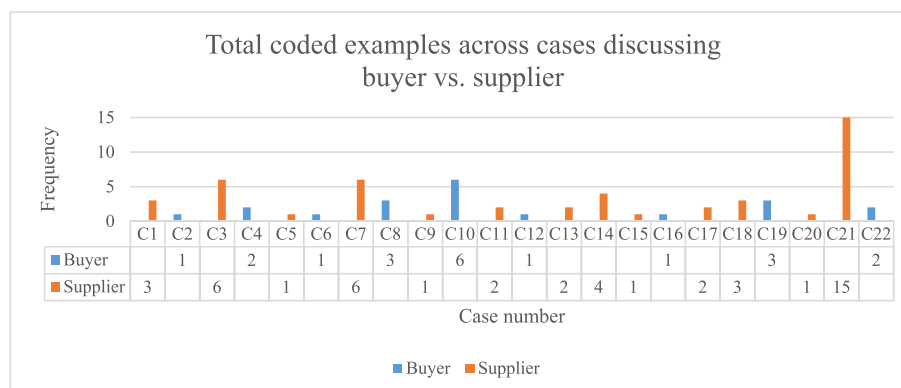


Fig. 2. Total coded examples across cases discussing buyer vs. supplier.

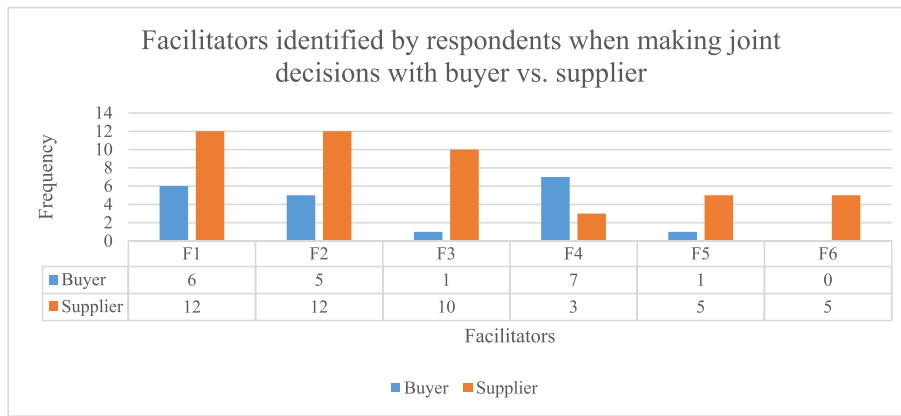


Fig. 3. Facilitators identified by respondents when making joint decisions with buyer vs. supplier.

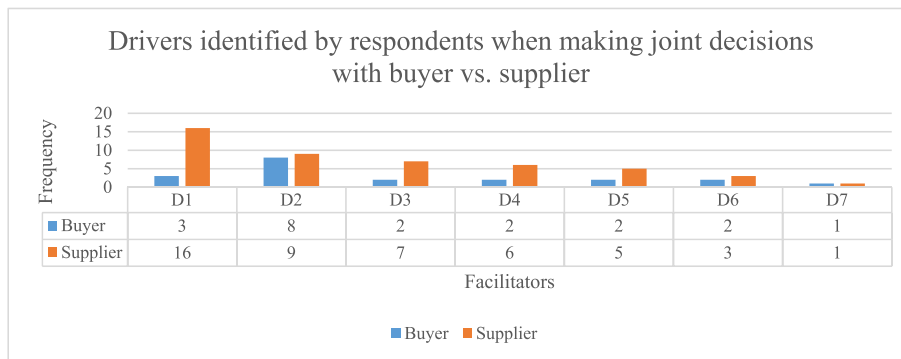


Fig. 4. Drivers identified by respondents when making joint decisions with buyer vs. supplier.

co-occurrences and an increase in joint decision-making activities, relationship satisfaction, and long-term collaboration. When there are more co-occurrences between drivers and facilitators in a dyadic relationship, we infer that the value of joint decisions is expected to be higher than individual decisions. The level of satisfaction in the joint decision-making process is expected to be higher too.

The co-occurrences of drivers and facilitators mobilizing joint decision-making are ordered in a Pareto graph (Fig. 5). We select combinations of drivers and facilitators that emerged in at least three cases, and provide our additional insights for a total of 11 co-occurrences below, ordered from the most apparent one.

5.2.1. Identified in 5 cases

- i. D1F1: driven by access to resources & capacity, facilitated by transaction history

JD facilitator’s overemphasis on transaction history shows that high-tech companies do not always have to rely on a binding contract to guarantee access to external resources. In some cases, repeat transactions with consistently performing actors are enough to believe that it will enable the process of joint decision-making.

5.2.2. Identified in 4 cases

- i. D1F2: driven by access to resources & capacity, facilitated by ease of access

Ease of access includes seamless knowledge sharing and communication, such as access to supplier databases, sharing strategic information with suppliers on client orders, and allowing more confidence between actors to make joint decisions. In high-tech

companies, ease of access is considered necessary to support collaborative efforts on resource sharing and capacity building.

- ii. D1F3: driven by access to resources & capacity, facilitated by ERP/EDI systems

Across the high-tech industry, subcontracting non-core manufacturing technologies is typical. EDI/ERP may help supply chain partners communicate better, track supplies, and manage operations, thus enabling joint decision-making to acquire efficiencies from external resources.

- ii. D2F1: driven by adaptation to market developments/maintenance of client base, facilitated by transaction history

Transaction history offers data that may be used to improve client experiences, satisfaction, and loyalty. In high-tech company, demand volatility could pose some business risks. The availability of historical data can allow further analysis to foster data-driven joint decision-making among collaborators, giving them improved visibility, predictive power, and improved responsiveness to changes.

- iv. D2F2: driven by adaptation to market developments/maintenance of client base, facilitated by ease of access

The need for supplier adaptability is heightened when information exchange is constrained, limiting supplier visibility to the real demand. When information sharing is made seamless, this ease of access will help high-tech firms to collaborate and make more sound decisions to address market changes.

Table 13
Co-occurrence of driver and facilitator of joint decision-making.

DRIVERS \ FACILITATORS	To access resources & capacity	To adapt to market developments/maintain client base	To align financial incentives	To share risks	To access new market	To incite more commitment from collaborator	To reach target cost	Sum
Transaction history	C7 C8 C11 C17 C21	C7 C8 C19 C21	C20	C7 C8 C12 C21	C21	C11 C17	C16	18
Ease of access	C3 C4 C14 C21	C1 C10 C19 C21	C1 C3 C14	C21	C1 C10 C21	C9 C10		17
ERP/EDI systems	C3 C14 C18 C21	C18 C19 C21	C3 C14	C21	C21			11
Established contract	C13	C2 C10 C13 C22	C6 C22		C10	C10	C15	10
Location proximity	C3 C4 C7	C7	C3	C7				6
Trust and openness	C5 C21	C21		C21	C21			5
Sum	19	17	9	8	7	5	2	

Note: the color in Table 13 represents the co-occurrences or combinations of drivers and facilitators across joint decision-making with the highest number of representing samples. These colors are green (5 cases), dark blue (4 cases), yellow (3 cases), grey (2 cases), red (1 case), and light blue (0 case).

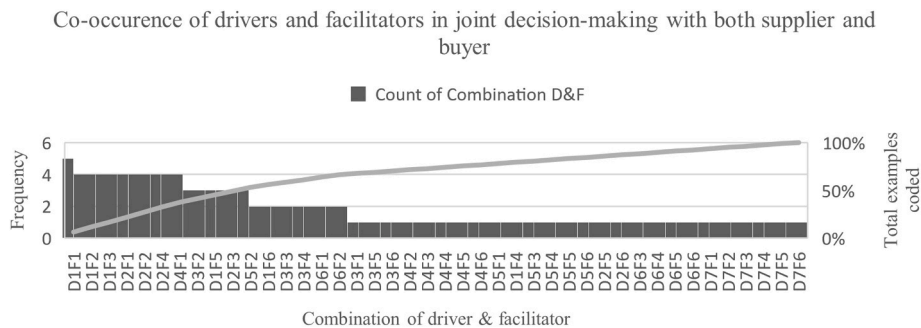


Fig. 5. Pareto of co-occurrence of drivers and facilitators.

v. D2F4: driven by adaptation to market developments/maintenance of client base, facilitated by established contract

Frequently, inter-firm collaboration procedures used for supply chain management are typically unique to the firms that deploy them. Therefore, to avoid risks associated with collaboration, partners need to agree on procedures that clearly define the mechanism that govern collaborative efforts. Contracts seem to be common among high-tech companies to help govern joint decision-making.

vi. D4F1: driven by risk sharing, facilitated by transaction history

The high-tech industry is exposed to the risk of demand volatility, stock out due to the lack of production capacity, and slow return of high investment costs, among others. Regardless of how diverse the risk appetite of a firm, the need to share risk may also motivate firms to make joint decisions. Transaction history provides a clear ground to do so through traceable, reliable data on the capacity of partners to address

these risks.

5.2.3. Identified in 3 cases

i. D3F2: driven by financial incentives alignment, facilitated by ease of access

An important objective of making any decisions whether jointly or individually is to safeguard financial goals. Incentives like profit sharing and business volume coupled with fair business practice may help ensure a suitable distribution of financial advantages. Ease of information exchange in joint decision-making may lead to a more aligned incentive throughout supply chain partners through improved visibility over cost structure, market and sales information, and other expenses.

ii. D1F5: driven by access to resources & capacity, facilitated location proximity

Due to the nature of high-tech products, export control is often applied, preventing companies to seamlessly send orders and collaborate production with overseas entities at times. Although location is merely one particular facet of supply chain design, it may offer firms in proximity, such as those located in the same cluster, a competitive advantage. The sheer distance allows them to afford resource sharing through joint decision making.

- ii. D2F3: driven by adaptation to market developments/maintenance of client base, facilitated by ERP/EDI systems

Information platform and technologies like EDI/ERP and RFID to facilitate communication among partners throughout the supply chain will help reduce service costs and response times to market. This will allow high-tech firms to have greater visibility to make sound joint decisions to adapt to shifting market demands.

- iv. D5F2: driven by access to a new market, facilitated by ease of access

To allow collaborative firms to easily exchange knowledge and brainstorm new market opportunities, good inter-firm communication both officially and informally is critical. Likewise, information sharing is required to make joint decisions to align the capabilities of stakeholders to prepare for a new market.

Additionally, we observed different order of co-occurrences based on frequency indicated across cases focusing on the relationship with buyer vs. with supplier.

Across three cases discussing buyers (Fig. 6), D2F4 (driven by adaptation to market developments/maintenance of client base, facilitated by established contract) is identified. This may indicate that suppliers manage their buyers via established contract. However, this co-occurrence is not indicative of their preferences, only what seems to be common to co-occur when they make decisions with a buyer. Contracts may seem to be rigid and expose suppliers to risks of non-compliance. On the other hand, contracts help suppliers to secure volume and help them significantly to adjust internal production planning, provided that the clauses in contract also put constraints on buyers to comply with the planned orders and payments.

On the other hand, across cases discussing suppliers (Fig. 7), D1F1 (driven by access to resources & capacity, facilitated by transaction history) and D1F3 (driven by access to resources & capacity, facilitated by ERP/EDI systems) are each identified four times. This may indicate that the ultimate goal of buyers (manufacturers) in collaborative decision-making is to tap extra resources from their suppliers. Transaction history as well as ERP/EDI systems seem to be helpful tools to provide governance, control, as well as visibility necessary to inform joint decision-making.

5.2.3.1. *Further contextual insights.* Our sector of choice for empirical investigation is the high-tech sector. This includes all companies that

supply material or use it to manufacture an R&D intensive product, such as in computing and automation, machinery, medical equipment, semiconductor equipment and robotics. High tech industry is characterized by its strong innovativeness over its low-tech counterparts (Chandra and Macpherson, 1994). With outputs including highly customized products, high tech companies thrive on particular knowledge, precision, and efficiency in their production process. To ensure innovation, high tech companies work closely with their suppliers and customers, each lending a resource for one another. Thus, there are numerous opportunities to make joint decisions with suppliers or customers. We chose to consider the high-tech industry in the Netherlands, particularly the semiconductor cluster. This way, we expected to gain more examples of potential joint decisions and individual ones to illustrate the issue better.

One of the overarching or recurrent themes of joint decisions in high tech supply chains is capacity management, where decisions such as supplier selection, inventory, production process, and logistics become supporting pillars. Managing capacity is likely the most critical component in high-tech businesses with high capital equipment costs, such as semiconductors. Because of the quick pace of technological innovation, firms have volatile demand, short product lifecycles, low yield, and typically extensive manufacturing lead times. According to the Semiconductor Industry Association, equipment procurement wait times might be as lengthy as one year (Varas et al., 2020). This condition allows demand changes to precede capacity lead periods. Economic uncertainty exacerbates these issues by adding greater uncertainty towards inventory decisions and causing a dilemma of whether to add a surplus, costly capacity to protect against volatile demand. Building a brand-new semiconductor fab, for example, can cost billions of dollars, and a single workshop unit can cost millions (Wu et al., 2005).

This foregoing environment forces semiconductor makers to be very cautious about the flexibility of eventual capacity increase (Erkoc and Wu, 2004). However, for these firms to maintain client base and capture revenue opportunities in a rapidly expanding tech market, being too cautious and rigid with capacity increase could lead to serious service gaps and potentially lost market. Therefore, businesses must work with their suppliers or customers to build a flexible supply chain capacity to react to demand spikes from new product launches and market upswing and absorb short-term losses from technology migration and competitive downturn (Wu et al., 2005). High tech firms are often exposed to the need to collaborate and involve other firms in supply chain decision-making to achieve flexibility. For this reason, we decided that decision-making structure across high tech industry remain interesting to investigate, and we invite researchers to pursue further investigation in this topic.

5.2.4. *Recommendations for practitioners*

As an insight for practitioners, we identified a number of suggestions to support decision-makers in making joint decisions. We summarize these suggestions below.

Creating a conducive culture: To maximize the advantages of joint

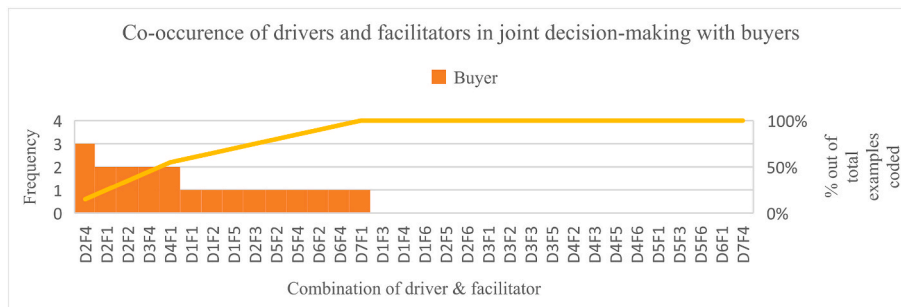


Fig. 6. Co-occurrence of drivers and facilitators in joint decision-making with buyers.

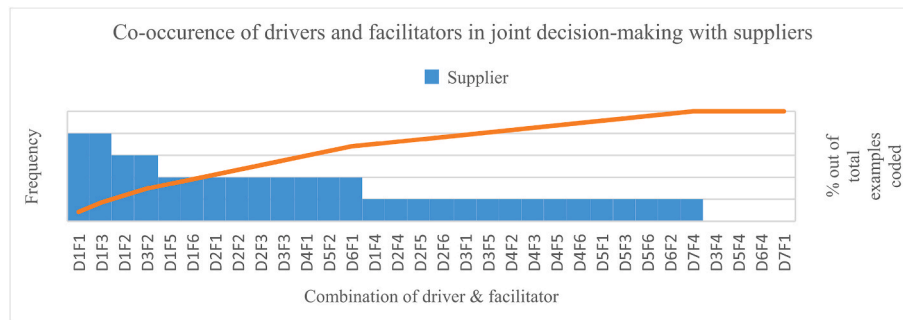


Fig. 7. Co-occurrence of drivers and facilitators in joint decision-making with suppliers.

decision-making, both buyers and suppliers must foster an environment of open communication, mutual support and accommodation, and strong project commitment (Hoegl and Wagner, 2005). It is essential to question and challenge any perception of one party's technological, financial, or resource superiority over the other. In collaborative efforts, even long-term partners may fail without a well-structured joint project team with aligned objectives and complementary capabilities (Bidault and Castello 2010). Thus, companies and all employees at all levels are advised to prioritize aligning drivers with collaborators before making any joint decisions.

Diversifying collaborators: Ease of access and commonalities in company values are expected to facilitate joint decision-making, leading to performance improvements. However, performance starts to decrease when there is "groupthink" caused by homogeneity (Janis, 1982) and "isomorphism" (Uzzi, 1997). By becoming overly homogenous and similar in their decision-making drivers, the customer and supplier risk making poor judgments (Bendoly et al., 2010). Buyers and suppliers are less inclined to accept opposing viewpoints and review the current relationship. Also, as the partnership matures, the customer and supplier lose focus on everyday activities and operations and become disinterested in using their creativity to foster innovation (Villena et al., 2011). Therefore, making a joint decision with a partner when a facilitator is lacking is not necessarily irrelevant to progress.

Distributing incentives: Although joint decision-making could add value to the supply chain's overall success and may lead to a cumulative increase in profitability of all of its members, another challenge arises in how to split this gain. Ideally, joint gain should be distributed among the companies under some reasonable normative standard of fairness (Fink, 2004). However, Williamson (1985, p. 63) notes that both buyer and seller are strategically poised to haggle over the disposal of any additional gain anytime the other side proposes to adapt. Emerson (1987) adds that each party, despite having a profit-maximizing orientation, is interested in capturing as much of the benefit as possible on each occasion. Given this dynamic, failure to achieve an agreement on how to distribute the benefits generated via joint decision-making might be a possible obstacle (Lambert, 2010).

Moreover, shared gain in complicated collaborative environments like R&D across high-tech industries might be challenging to apportion (Senter and Flynn, 1999). Dividing profits may be easier than dividing intellectual property rights and other intangible gains, for example. The methods buyers and suppliers use to assess their joint gain need to be further assessed.

Maintaining transparency: To evaluate joint decision-making, a willingness to disclose essential financial information is vital to assess the value and performance of past joint efforts objectively. Unless this data-driven evaluation is done, it would be challenging to monitor and judge the importance of repeating a joint decision-making in the future, and companies might miss out on the opportunities of co-creating value (Teece, 2007).

Evaluating past performances: Both members of a dyad must be capable of observing and deriving meaning from the data using the same

method, of exchanging objective and transparent information so that they can understand the value of their contributions (Bunderson and Sutcliffe, 2002), achieve a shared awareness of strategic concerns in their relationship (Fugate et al., 2009), which leads to shared knowledge on when and how to respond to any future changes (Revilla and Knoppen, 2015) instead of widely divergent opinions and interpretations.

Integrating transaction platform: A possible solution to help maintain transparency and evaluate past performances is by having one platform to store all the transaction data and activities of a dyad to provide the best. This transparency, however, requires equal commitment for both parties to integrate an IT platform and might need a joint learning capacity from both parties when a new platform is required to roll out (Wang et al., 2013).

6. Conclusion

Our main finding is that the two most represented drivers of joint decision-making are the need to access the resources and capacity of another firm, and the need to adapt to market developments/maintain client base, while the two most frequently represented facilitators or enablers of joint decision-making are transaction history and ease of access. Second, as reflected across the cases, we discovered that the majority of joint decisions occur when the following drivers and facilitators co-occur: i) the need to access resources/capacity and the availability of transaction history, ERP/EDI systems, and ease of access; ii) the need to adapt to market developments/maintain client base and the availability of transaction history, established contract, and ease of access. Third, we found that the first set of co-occurrences is more apparent in buyers, whereas the second set is more apparent in suppliers. Fourth, we find that a favorable association exists between the existence of driver-facilitator interactions and an increase in collaborative decision-making activities, relationship satisfaction, and long-term cooperation. When drivers and facilitators co-occur more often in a dyadic relationship, we conclude that the value of joint decision-making is predicted to be greater than the value of individual decisions, as well as the degree of satisfaction with the joint decision-making process.

From this study, we observe and confirm that resource dependency theory may help in explaining the drivers of joint decision-making among manufacturers when they have to involve suppliers to access resources. Transaction cost economics help to examine why long transaction history, binding contract, and integrated EDI/ERP platforms could create higher switching costs between companies, especially for buyers. The apparent joint decision-making between companies who have these facilitators may be the result of such lock-in circumstances. Using a social exchange perspective, we may explain how binding contracts could be a helpful tool for decision-makers to provide a sense of security, especially when uncertainty is high, and behavior of partners is less predictable.

Limitations and suggestions for future research

This research has several limitations that allow room for improvements and suggestions for future research. First, due to limited space, despite borrowing the lens from resource dependency theory, this research is isolated from the inter-firm political or power elements that may influence the decision-making structure. It would be interesting for future research to investigate this topic in depth and clarify how power balance in a dyad may affect companies' desire to go for or to avoid collaborative decisions. Second, this study does not consider the various magnitudes of involvement, investment, or commitment required from each actor during joint decisions. It is worth focusing analysis on how these variables change in the presence or absence of drivers and facilitators. Third, this study does not include financial or other metrics to consider the actual joint decision-making outcomes for businesses, only relying on subjective experiences of decision-makers. Despite our attempts to minimize case selection and response bias, there might be room to eliminate these further. Future research may develop methods to combine both financial and interview data for cross references. Fourth, due to the general difficulty in contacting respondents, the cases presented are limited in number. Future studies may complement the study with further evidence, with greater number of samples, to allow subsequent statistical analysis. Fifth, using Lambert et al. (1996) categorization of partnership types (Type I, Type II, Type III), future research may complement this study by examining how the drivers and facilitators might differ among these partnership types.

Finally, we note that this study solely gathered focal companies' responses on their inter-firm relations with a supplier and a customer, potentially leading to bias across findings. Since the information gathered during the interview is often delicate and may be subject to

confidentiality, we aimed to provide a safe environment for managers to speak their voices without fear of relational repercussions. Nevertheless, those suppliers and clients may have differing opinions on how successfully they collaborated with the focal company. Collecting data from both the supplier and customer firms could further increase the validity and reliability of the findings. In addition to that, this study has only investigated as-is situations as perceived by focal companies' representatives. Meanwhile, it is important to examine further how these opinions may differ after an extended relationship with a particular supplier or client firm. Therefore, future research could consider incorporating longitudinal data to enrich this research.

Author statement

Kartika Nurhayati: Conceptualization, Methodology, Investigation, Data Curation, Analysis, Proposition, Writing –Original Draft, Writing -Review & Editing, Visualization, Project administration. Lóránt Tavasszy: Conceptualization, Methodology, Investigation, Analysis, Writing -Review & Editing, Supervision, Project administration. Jafar Rezaei: Conceptualization, Methodology, Analysis, Writing -Review & Editing, Supervision, Project administration.

Data availability

The data that has been used is confidential.

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Appendix 1

List of questions: guide for interviewer in semi-structured interview.

Research question	Constructs	Question for interviewees
What are the drivers and facilitators to make decisions with your partners? What are the drivers and facilitators to NOT make decisions with your partners?	Decision-making structure: ID/JD Probe for JD 'drivers': access to resources, risk sharing, financial incentive distribution, alignment of target cost, market access Probe for JD 'facilitators': ERP, ease of access, location proximity, transaction history, established contract, trust	[Note to interviewer: Before asking these questions, please define what JD and ID are so that respondents understand the context and provide relevant responses. Ask respondents to explain JD in their own words to ensure similar understanding of constructs.] Think of and pick one supplier (or one B2B customer that is a manufacturing company). How familiar are you with that company, based on your day-to-day interaction with them? Unfamiliar vs. familiar. Select only companies with answer 'familiar' and minimum period of interaction of at least one year. JD What motivates you to make JD with your partners? Probe: JD 'drivers'. What kind of supply chain decisions are usually made jointly with your partners? Give examples. What facilitates your JD process with your partners? Probe: JD 'facilitators'. What are the challenges or barriers in making JD? ID In which circumstances do you find the lack of—or no need to—make JD with your partners? What kind of supply chain decisions are better made individually by your company without involving your partner? In which circumstances do you find the need to make JD with your partners but denied the chance to do so/refused by your partner? → this may be indicative of the decisions your partner wants full control of or lacks of interest in. What kind of decisions are better made jointly involving your partner, yet you have little access to do so, thus resorting to making ID? → this is about the lack of facilitators that allows you to make JD, even when the partner wants it too. "Is there anything we haven't addressed yet that might be necessary to discuss?"

References

- Agarwal, U.A., Narayana, S.A., 2020. Impact of relational communication on buyer–supplier relationship satisfaction: role of trust and commitment. *Benchmark Int. J.* 27 (8), 2459–2496.
- Alsaad, A., Mohamad, R., Ismail, N.A., 2019. The contingent role of dependency in predicting the intention to adopt B2B e-commerce. *Inf. Technol. Dev.* 25 (4), 686–714.
- Anderson, J.C., Narus, J.A., 1990. A model of distributor firm and manufacturer firm working partnerships. *J. Market.* 54 (1), 42–58.
- Aoki, K., Lennerfors, T.T., 2013. Global business the new, improved keiretsu. *Harv. Bus. Rev.* 91 (9), 109–+.
- Arshinder, K., Kanda, A., Deshmukh, S.G., 2011. A review on supply chain coordination: coordination mechanisms, managing uncertainty and research directions. *Supply chain coordination under uncertainty* 39–82.
- Attaran, M., Attaran, S., 2007. Collaborative supply chain management: the most promising practice for building efficient and sustainable supply chains. *Bus. Process Manag. J.* 13 (3), 390.
- Badraoui, I., Van der Vorst, J.G., Boulaksil, Y., 2020. Horizontal logistics collaboration: an exploratory study in Morocco's agri-food supply chains. *Int. J. Logist. Res. Appl.* 23 (1), 85–102.
- Bandara, W., 2006. Using Nvivo as a research management tool: a case narrative. In: *Proceedings of the 3rd International Conference on Qualitative Research in IT and IT in Qualitative Research. Institute for Integrated and Intelligent Systems*, pp. 6–19.
- Bello, D.C., Gilliland, D.I., 1997. The effect of output controls, process controls, and flexibility on export channel performance. *J. Market.* 61 (1), 22–38.
- Bendoly, E., Croson, R., Goncalves, P., Schultz, K., 2010. Bodies of knowledge for research in behavioral operations. *Prod. Oper. Manag.* 19 (4), 434–452.
- Bernheim, B.D., Whinston, M.D., 1998. Exclusive dealing. *J. Polit. Econ.* 106 (1), 64–103.
- Bidault, F., Castello, A., 2010. Why too much trust is death to innovation. *MIT Sloan Manag. Rev.* 51 (4), 33.
- Bildsten, L., 2014. Buyer-supplier relationships in industrialized building. *Construct. Manag. Econ.* 32 (1–2), 146–159.
- Blau, P.M., 1968. Social exchange. *International encyclopedia of the social sciences* 7 (4), 452–457.
- Bunderson, J.S., Sutcliffe, K.M., 2002. Comparing alternative conceptualizations of functional diversity in management teams: process and performance effects. *Acad. Manag. J.* 45 (5), 875–893.
- Chandra, B., Macpherson, A.D., 1994. The characteristics of high-technology manufacturing firms in a declining industrial region: an empirical analysis from western New York. *Enterpren. Reg. Dev.* 6 (2), 145–160.
- Chang, H.H., Wong, K.H., Chiu, W.S., 2019. The effects of business systems leveraging on supply chain performance: process innovation and uncertainty as moderators. *Inf. Manag.* 56 (6), 103140.
- Chen, Y., Coviello, N., Ranaweera, C., 2021. When change is all around: how dynamic network capability and generative NPD learning shape a firm's capacity for major innovation. *J. Prod. Innovat. Manag.* 38 (5), 574–599.
- Cheung, M.F., To, W.M., 2010. Management commitment to service quality and organizational outcomes. *Manag. Serv. Qual.: Int. J.* 20 (3), 259.
- Claro, D.P., Claro, P.B.O., 2010. Collaborative buyer–supplier relationships and downstream information in marketing channels. *Ind. Market. Manag.* 39 (2), 221–228.
- Das, T.K., Teng, B.S., 2002. Alliance constellations: a social exchange perspective. *Acad. Manag. Rev.* 27 (3), 445–456.
- de Mattos, C.A., Barbin Laurindo, F.J., 2015. Collaborative platforms for supply chain integration: trajectory, assimilation of platforms and results. *J. Technol. Manag. Innovat.* 10 (2), 79–92.
- Dwyer, F.R., Schurr, P.H., Oh, S., 1987. Developing buyer–seller relationships. *J. Market.* 51 (2), 11–27.
- Edlin, A., Reichelstein, S., 1996. Holdups, Standard Breach Remedies, and Optimal Investment. *Amer. Econ. Rev.* 86 (3), 478–501.
- Efrat, K., Oyna, S., 2021. An interaction orientation approach to SME-Intermediaries relationships. *Eur. Manag. J.* 39 (4), 508–520.
- Eisenhardt, K.M., 1989. Building theories from case study research. *Acad. Manag. Rev.* 14 (4), 532–550.
- Emerson, R.M., 1987. *Social Exchange Theory*.
- Erkoc, M., Wu, S.D., 2004. Capacity Reservation across Multiple Buyers. Working Paper. Lehigh University, Bethlehem, PA.
- Fink, A., 2004. Supply chain coordination by means of automated negotiations, 2004. *Proceedings of the. In: 37th Annual Hawaii International Conference on System Sciences. IEEE*, p. 10.
- Frohlich, M.T., Westbrook, R., 2001. Arcs of integration: an international study of supply chain strategies. *J. Oper. Manag.* 19 (2), 185–200.
- Fugate, B.S., Stank, T.P., Mentzer, J.T., 2009. Linking improved knowledge management to operational and organizational performance. *J. Oper. Manag.* 27 (3), 247–264.
- Hallinen, A., Törnroos, J.Ä., 2005. Using case methods in the study of contemporary business networks. *J. Bus. Res.* 58 (9), 1285–1297.
- Heide, J.B., 1994. Interorganizational governance in marketing channels. *J. Market.* 58 (1), 71–85.
- Heide, J.B., John, G., 1990. Alliances in industrial purchasing: the determinants of joint action in buyer–supplier relationships. *J. Market. Res.* 27 (1), 24–36.
- Hoegl, M., Wagner, S.M., 2005. Buyer–supplier collaboration in product development projects. *J. Manag.* 31 (4), 530–548.
- Holcomb, T.R., Hitt, M.A., 2007. Toward a model of strategic outsourcing. *J. Oper. Manag.* 25 (2), 464–481.
- Huang, Y., Han, W., Macbeth, D.K., 2020. The complexity of collaboration in supply chain networks. *Supply Chain Manag.: Int. J.* 25 (3), 393–410.
- Inkpen, A.C., Tsang, E.W., 2005. Social capital, networks, and knowledge transfer. *Acad. Manag. Rev.* 30 (1), 146–165.
- Irani, Z., Kamal, M.M., Sharif, A., Love, P.E., 2017. Enabling sustainable energy futures: factors influencing green supply chain collaboration. *Prod. Plann. Control* 28 (6–8), 684–705.
- Janis, I.L., 1982. *Groupthink: Psychological Studies of Policy Decisions and Fiascos*. Houghton Mifflin, Boston.
- Jap, S.D., 1999. Pie-expansion efforts: collaboration processes in buyer–supplier relationships. *J. Market. Res.* 36 (4), 461–475.
- Jap, S.D., Ganesan, S., 2000. Control mechanisms and the relationship life cycle: implications for safeguarding specific investments and developing commitment. *J. Market. Res.* 37 (2), 227–245.
- Johnston, D.A., McCutcheon, D.M., Stuart, F.I., Kerwood, H., 2004. Effects of supplier trust on performance of cooperative supplier relationships. *J. Oper. Manag.* 22 (1), 23–38.
- Kale, P., Dyer, J., Singh, H., 2001. Value creation and success in strategic alliances: alliancing skills and the role of alliance structure and systems. *Eur. Manag. J.* 19 (5), 463–471.
- Lambert, D.M., 2010. Customer relationship management as a business process. *J. Bus. Ind. Market.*
- Lambert, D.M., Enz, M.G., 2012. Managing and measuring value co-creation in business-to-business relationships. *J. Market. Manag.* 28 (13–14), 1588–1625.
- Lambert, D.M., Emmelhainz, M.A., Gardner, J.T., 1996. So you think you want a partner? *Market. Manag.* 5 (2), 24.
- Lane, P.J., Lubatkin, M., 1998. Relative absorptive capacity and interorganizational learning. *Strat. Manag. J.* 19 (5), 461–477.
- Lee, H., Choi, B., 2003. Knowledge management enablers, processes, and organizational performance: an integrative view and empirical examination. *J. Manag. Inf. Syst.* 20 (1), 179–228.
- Lei, D., Slocum Jr., J.W., Pitts, R.A., 1997. Building cooperative advantage: managing strategic alliances to promote organizational learning. *J. World Bus.* 32 (3), 203–223.
- Leiringer, R., Green, S.D., Raja, J.Z., 2009. Living up to the value agenda: the empirical realities of through-life value creation in construction. *Construct. Manag. Econ.* 27 (3), 271–285.
- Liu, Y., Luo, Y., Liu, T., 2009. Governing buyer–supplier relationships through transactional and relational mechanisms: evidence from China. *J. Oper. Manag.* 27 (4), 294–309.
- Lockström, M., Schadel, J., Harrison, N., Moser, R., Malhotra, M.K., 2010. Antecedents to supplier integration in the automotive industry: a multiple-case study of foreign subsidiaries in China. *J. Oper. Manag.* 28 (3), 240–256.
- Macneil, I., 1993. *The New Social Contract*, 1980. Yale University, New Haven, London.
- Madlberger, M., 2009. What drives firms to engage in interorganizational information sharing in supply chain management? *Int. J. e-Collaboration* 5 (2), 18–42.
- Malhotra, A., Gosain, S., Sawy, O.A.E., 2005. Absorptive capacity configurations in supply chains: gearing for partner-enabled market knowledge creation. *MIS Q.* 145–187.
- Mason, R.B., 2007. *The External Environment's Effect on Management and Strategy: a Complexity Theory Approach*. Management decision.
- Mayer, K.J., Teece, D.J., 2008. Unpacking strategic alliances: the structure and purpose of alliance versus supplier relationships. *J. Econ. Behav. Organ.* 66 (1), 106–127.
- McEvily, B., Zaheer, A., Kamal, D.K.F., 2017. Mutual and exclusive: dyadic sources of trust in interorganizational exchange. *Organ. Sci.* 28 (1), 74–92.
- McIntyre, T., Wilson, M.M., Schulze-Ehlers, B., Childerhouse, P.H.J., 2018. *The Governance of Value Creation and Capture in Agri-Food Supply Chains: A Conceptual Framework, Propositions and Protocols*.
- Middendorp, T.J., 2022. *Understanding Value Co-creation between Service Providers and Customers in B-To-B Context: a Micro-level Case Study* (Master's Thesis. University of Twente.
- Miles, M.B., Huberman, A.M., 1994. *Qualitative Data Analysis: an Expanded Sourcebook*. sage.
- Moch, M.K., Seashore, S., 1981. *Norms Governing Corporate Behavior: an Alternative to Markets and to Administration*.
- Modi, S.B., Mabert, V.A., 2007. Supplier development: improving supplier performance through knowledge transfer. *J. Oper. Manag.* 25 (1), 42–64.
- Morgan, R.M., Hunt, S.D., 1994. The commitment-trust theory of relationship marketing. *J. Market.* 58 (3), 20–38.
- Niemelä, T., 2004. Interfirm cooperation capability in the context of networking family firms: the role of power. *Fam. Bus. Rev.* 17 (4), 319–330.
- Noordewier, T.G., John, G., Nevin, J.R., 1990. Performance outcomes of purchasing arrangements in industrial buyer–vendor relationships. *J. Market.* 54 (4), 80–93.
- Nurhayati, K., Rezaei, J., Tavasszy, L., 2021. The interplay between power structure and decision-making in supply chains: a systematic review. *Journal of Supply Chain Management Science* 2 (3–4), 85–114.
- Panahifar, F., Heavey, C., Byrne, P.J., Fazlollahtabar, H., 2015. A framework for collaborative planning, forecasting and replenishment (CPFR): state of the art. *J. Enterprise Inf. Manag.* 28 (6), 838–871.
- Park, S.H., Ungson, G.R., 1997. The effect of national culture, organizational complementarity, and economic motivation on joint venture dissolution. *Acad. Manag. J.* 40 (2), 279–307.
- Peng, G., 2011. *Inter-organizational Information Exchange, Supply Chain Compliance and Performance*. Wageningen University and Research.
- Pfeffer, J., 1982. *Organizations and Organization Theory*. Pitman, Boston, pp. 237–251.

- Poppo, L., Zenger, T., 2002. Do formal contracts and relational governance function as substitutes or complements? *Strat. Manag. J.* 23 (8), 707–725.
- Prajogo, D., Olhager, J., 2012. Supply chain integration and performance: the effects of long-term relationships, information technology and sharing, and logistics integration. *Int. J. Prod. Econ.* 135 (1), 514–522.
- Ragatz, G.L., Handfield, R.B., Scannell, T.V., 1997. Success factors for integrating suppliers into new product development. *J. Prod. Innovat. Manag.: An International Publication of the Product Development & Management Association* 14 (3), 190–202.
- Ragin, C.C., 1987. *The Comparative Method: Moving beyond Qualitative and Quantitative Strategies*. Berkeley 1987.
- Revilla, E., Knoppen, D., 2015. Building knowledge integration in buyer-supplier relationships: the critical role of strategic supply management and trust. *Int. J. Oper. Prod. Manag.* 35 (10), 1408–1436.
- Revilla, E., Villena, V.H., 2012. Knowledge integration taxonomy in buyer-supplier relationships: trade-offs between efficiency and innovation. *Int. J. Prod. Econ.* 140 (2), 854–864.
- Saenz, M.J., Revilla, E., Knoppen, D., 2014. Absorptive capacity in buyer-supplier relationships: empirical evidence of its mediating role. *J. Supply Chain Manag.* 50 (2), 18–40.
- Sahin, F., Robinson, E.P., 2002. Flow coordination and information sharing in supply chains: review, implications, and directions for future research. *Decis. Sci. J.* 33 (4), 505–536.
- Saito, H., Ruhanen, L., 2017. Power in tourism stakeholder collaborations: power types and power holders. *J. Hospit. Tourism Manag.* 31, 189–196.
- Sanders, N.R., 2008. Pattern of information technology use: the impact on buyer-supplier coordination and performance. *J. Oper. Manag.* 26 (3), 349–367.
- Scuotto, V., Caputo, F., Villasalero, M., Del Giudice, M., 2017. A multiple buyer-supplier relationship in the context of SMEs' digital supply chain management. *Prod. Plann. Control* 28 (16), 1378–1388.
- Senter, R., Flynn, M.S., 1999. Changing interorganizational patterns in the North American automotive supply chain. *Appl. Behav. Sci. Rev.* 7 (1), 59–80.
- Simatupang, T.M., Sridharan, R., 2005. The collaboration index: a measure for supply chain collaboration. *Int. J. Phys. Distrib. Logist. Manag.* 35 (1), 44–62.
- Singh, H., Garg, R., Sachdeva, A., 2018. Supply chain collaboration: a state-of-the-art literature review. *Uncertain Supply Chain Management* 6 (2), 149–180.
- Stake, R.E., 1995. *The Art of Case Study Research*. sage.
- Stern, L.W., Ansary, A.I.E., Coughlan, A.T., 1996. *Marketing Channels*, 5th. Prentice Hall, New York.
- Teece, D.J., 2007. Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strat. Manag. J.* 28 (13), 1319–1350.
- Tjemkes, B., Vos, P., Burgers, K., 2017. *Strategic Alliance Management*. Routledge.
- Uzzi, B., 1997. Towards a network perspective on organizational decline. *Int. J. Sociol. Soc. Pol.* 17, 111–155.
- Varas, A., Varadarajan, R., Goodrich, J., Yinug, F., 2020. *Government Incentives and US Competitiveness in Semiconductor Manufacturing*. Boston Consulting Group.
- Villena, V.H., Revilla, E., Choi, T.Y., 2011. The dark side of buyer-supplier relationships: a social capital perspective. *J. Oper. Manag.* 29 (6), 561–576.
- Voss, K.E., Tanner, E.C., Mohan, M., Lee, Y.K., Kim, H.K., 2019. Integrating reciprocity into a social exchange model of inter-firm B2B relationships. *J. Bus. Ind. Market.* 34 (8), 1668–1680.
- Wang, J.J.Y., Bensmail, H., Gao, X., 2013. Joint learning and weighting of visual vocabulary for bag-of-feature based tissue classification. *Pattern Recogn.* 46 (12), 3249–3255.
- White, R.D., 1999. Managing the diverse organization: the imperative for a new multicultural paradigm. *Publ. Adm. Manag.: An interactive journal* 4 (4), 469–493.
- Williamson, O.E., 1975. *Markets and Hierarchies: Analysis and Antitrust Implications: a Study in the Economics of Internal Organization*. University of Illinois (at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship).
- Williamson, O.E., 1987. Transaction cost economics: the comparative contracting perspective. *J. Econ. Behav. Organ.* 8 (4), 617–625.
- Woods, M., Paulus, T., Atkins, D.P., Macklin, R., 2016. Advancing qualitative research using qualitative data analysis software (QDAS)? Reviewing potential versus practice in published studies using ATLAS.ti and NVivo, 1994–2013. *Soc. Sci. Comput. Rev.* 34 (5), 597–617.
- Wu, S.D., Erkoc, M., Karabuk, S., 2005. Managing capacity in the high-tech industry: a review of literature. *Eng. Econ.* 50 (2), 125–158.
- Yin, R.K., 1989. *Interorganizational Partnerships in Local Job Creation and Job Training Efforts: Six Case Studies*. Final Report.
- Yin, R.K., 2003. Designing case studies. *Qualitative research methods* 5 (14), 359–386.
- Yin, R.K., 2009. *Case Study Research: Design and Methods*, vol. 5. sage.
- Zaheer, A., Venkatraman, N., 1995. Relational governance as an interorganizational strategy: an empirical test of the role of trust in economic exchange. *Strat. Manag. J.* 16 (5), 373–392.
- Zahoor, N., Al-Tabbaa, O., 2021. Post-entry internationalization speed of SMEs: the role of relational mechanisms and foreign market knowledge. *Int. Bus. Rev.* 30 (1), 101761.
- Zhang, A., 2014. *Collaboration in the Australian and Chinese Mobile Telecommunication Markets*. Springer, Berlin and Heidelberg.