

## **Managing multichannel conflict: The role of interactions enabled by interorganizational information system and public social media**

### **Abstract**

**Purpose** – Advances in information and communication technology have significantly enhanced firms' interactions. However, interactions enabled by interorganizational information system (IOS) and public social media (PSM) may affect channel conflict differently due to the two platforms' distinct characteristics. Drawing on open systems theory, we develop a conceptual framework that examines the effects of channel multiplicity on horizontal and vertical conflicts and the moderating roles of IOS- and PSM-enabled interactions in the relationship between channel multiplicity and channel conflict.

**Design/methodology/approach** – We test our research hypotheses using survey data from 520 manufacturers and regional economic development data from China. The collected data are analyzed using statistical inference.

**Findings** – The results confirm that channel multiplicity positively affects both horizontal and vertical conflicts and that these effects are moderated in different ways by IOS- and PSM-enabled interactions. IOS-enabled interactions attenuate the positive relationship between channel multiplicity and horizontal conflict, but strengthen the positive relationship between channel multiplicity and vertical conflict. By contrast, PSM-enabled interactions strengthen the positive relationship between channel multiplicity and channel conflicts.

**Originality/value** – Our findings provide insights into how managers can leverage IOS and PSM platforms to manage multichannel conflict among contemporary firms. Moreover, the results suggest that IOS- and PSM-enabled interactions play different informational roles in the relationship between channel multiplicity and conflicts, providing a meaningful perspective on firms' knowledge activities in the era of multichannel distribution.

**Keywords:** Channel multiplicity, Horizontal conflict, Vertical conflict, IOS-enabled interactions, PSM-enabled interactions

**Paper type:** Research paper

## **Introduction**

Channel conflict refers to the perception that a channel member's goal attainment has been blocked or impeded by another member (Gaski and Nevin, 1985). Such conflict has long been the focus of marketing research on distribution channels, as it can compromise channel members' relationships and performance (Eshghi and Ray, 2021). If poorly managed, channel conflict can cause customer dissatisfaction, sales deterioration, price wars, poor public relations, low trust and commitment among channel members, and even distributor exit (Coughlan *et al.*, 2006; Bai *et al.*, 2016). Unsurprisingly, many firms devote large amounts of resources to manage conflicts through implementing policies, mitigating disputes, and resolving litigation (Eshghi and Ray, 2021). However, managing channel conflict has become a growing challenge in the era of multichannel distribution, as firms are increasing their distribution channels to reach more market segments and to align those segments with their product lines and services in various channels.

This study first examines how channel conflict is influenced by channel multiplicity (i.e., the variety of distribution channels used by a manufacturer). We focus on the manufacturing industry, as it has become the norm for manufacturers to use multiple channels to reach and serve different market segments. Because the level of channel multiplicity can represent the scope and complexity of the distribution system, it follows naturally that the higher the channel multiplicity, the more the problems among channel members (e.g., challenges related to information asymmetry and disputes), which result in both horizontal conflict (among different types of distributors) and vertical conflict (between the manufacturer and its distributors) (See

Table 1 for an overview of the constructs in this research).

Insert Table 1 about here

We further examine the moderating role of information and communication technology (ICT) in the relationship between channel multiplicity and channel conflict. Firms' enhanced capability to collect, store, analyze, and communicate information driven by ICT advancement has resulted in more and deeper channel interactions (Tse *et al.*, 2023). Coughlan *et al.* (2006) note that frequent, candid, timely, and relevant information communication and interactions among channel members can help mitigate channel conflict. Increasing research attention has been paid to the crucial role of ICT-enabled interactions in the information sharing, learning, and relationships observed among firms (Rai *et al.*, 2010). Studies have identified the various antecedents and consequences of ICT such as the social influence/interaction, facilitating conditions, and supply chain integration that influence ICT implementation (Laumer and Maier, 2024; Yu *et al.*, 2017; Zhang *et al.*, 2016). ICT adoption also affects firms' dynamic capabilities, absorptive capacity, open innovation, relational governance, and performance (Alalwan *et al.*, 2021; Cuevas-Vargas *et al.*, 2022; Panagiotopoulos *et al.*, 2023).

Despite the contributions of the above and other studies, a few research gaps exist in the ICT literature. First of all, ICT-enabled interactions boost productivity and significantly influence performance (Millán *et al.*, 2021); however, their impact on multichannel conflict remains unclear. Moreover, ICT may not always provide firms with a high return on investment. Many firms overestimate its value and overspend on ICT to receive lower-than-expected performance in return (Zhang *et al.*, 2016; Karim *et al.*, 2022). One possible reason for these failures is that firms do not use the appropriate type of ICT for certain interaction tasks (Yoon and Cho, 2016). Current theoretical findings on the effects of ICT are also mixed (Zhang and Li, 2018; Cabellos *et al.*, 2024). The literature indicates that firms face high risks when implementing ICT, and that the misuse of emerging ICT may lead to unfavorable outcomes

(Ninaus *et al.*, 2021). It suggests that firms need to configure ICT in accordance with their specific objectives suitable platforms to better harness its benefits.

To bridge these research gaps, we focus on ICT-enabled interactions on two platforms predominantly used by manufacturers: interorganizational information system (IOS) and public social media (PSM) (Zhu *et al.*, 2023; Cui *et al.*, 2020; Li *et al.*, 2020). First, IOS encompasses electronic data interchange (EDI), customer relationship management (CRM), enterprise resource planning (ERP), workflow automation, and lotus notes, which expand to incorporate external data (Chi *et al.*, 2010). The information shared on IOS, which are invested in, monitored, and controlled by manufacturers, is mostly formal and structured. Second, while PSM is typically used by the general public, boundary-spanning individuals in distribution channels also use it for personal and business purposes and share emotional and informal information. Due to these differences, we argue that interactions on IOS and PSM can serve different purposes and have varying implications. Specifically, we posit that they moderate the relationship between channel multiplicity and conflicts, depending on the interaction platform (i.e., IOS or PSM) and conflict type (i.e., vertical or horizontal).

We ask the following three research questions: (1) How does channel multiplicity affect horizontal and vertical conflicts and thus channel performance? (2) How do IOS- and PSM-enabled interactions affect channel conflicts? and (3) What are the moderating roles of IOS- and PSM-enabled interactions in the relationship between channel multiplicity and channel conflicts?

We utilize both grounded theory and a survey approach; this combination is effective when researchers employ a grounded theory study, a qualitative method, to identify the key constructs and a survey, a quantitative method, to test the significance of the relationships among them (Venkatesh *et al.*, 2023; Driscoll *et al.*, 2007). Specifically, following the grounded theory approach, we conduct semi-structured interviews and perform a grounded theory study that identifies two platforms (IOSs and PSM) that are commonly used by firms. Next, we validate

our research framework that draws on open systems theory (see Figure 1), using primary survey data from 520 industrial manufacturers and secondary data on regional economic development from China.

Insert Figure 1 about here

This study makes the following three main contributions. First, while various approaches and strategies have been proposed to manage and resolve channel conflict, including aiming to improve trust, commitment, and dependence among members, no study has rigorously addressed the channel conflict problem from an information-sharing perspective. As the impact of information sharing on business-to-business relationships is understudied in the marketing literature, our research presents novel empirical evidence that ICT-enabled interactions, if managed well, can be used by firms to cope with channel conflict and improve channel performance.

Second, although information can be shared among firms on many platforms, we focus on IOS and PSM. Our findings bolster the literature, as prior studies have mostly examined the role of IOS-enabled interactions at the firm level, with few interorganizational-level studies. Research on social media has also focused on interactions among customers or between firms and customers, with little attention paid to information sharing among firms on PSM (Aral *et al.*, 2013). Consequently, the influence of PSM-enabled interactions on interfirm relationships remains unclear. This study compares and contrasts the two platforms and empirically demonstrates their different implications for channel conflict and performance.

Third, we extend the conventional wisdom that communicating information reduces channel conflict by establishing a boundary condition (Coughlan *et al.*, 2006). In particular, we argue and empirically show that the moderating effects of IOS- and PSM-enabled interactions on channel multiplicity are likely to lead to more channel conflict because of their strong positive interaction effects with channel multiplicity. Our findings on the moderating role of

ICT-enabled interactions provide important insights for firms in the era of multichannel distribution.

The remainder of this research is organized as follows. First, we develop the conceptual framework and hypotheses, followed by the research method and empirical findings. We conclude the article by discussing its theoretical and managerial implications.

## **Conceptual development**

This research takes the viewpoint of a multichannel manufacturer that strives to manage channel conflict to improve its channel performance; hence, the manufacturer is placed in a central strategic position. Drawing on open systems theory, we develop a conceptual framework to identify the effects of channel multiplicity on horizontal and vertical conflicts and examine the moderating roles of IOS- and PSM-enabled interactions in the relationship between channel multiplicity and channel conflicts. In the following, after a brief review of open systems theory, we first argue that channel multiplicity intensifies conflicts and that conflicts affect channel performance differently. Next, we identify IOS- and PSM-enabled interactions and focus on how they moderate the effects of channel multiplicity on conflicts in different ways.

### **Open systems theory**

Open systems theory takes a system-structural approach to organizational design. According to this theory, open systems consist of two or more interrelated subsystems embedded within an external environment, functioning as an “organized, unitary whole” with external interactions (Kast and Rosenzweig, 1985, p. 15). Each subsystem can be structured based on its liabilities to manage the internal and external environment (Fürst *et al.*, 2017). The interactions can internal—among the subsystems, and external—between the systems and the environment, taking the form of information, energy, or material transfers into or out of the system boundary.

Open systems theory asserts that the relationships among subsystems can have

destructive properties (Scott and Davis, 2015). If the numbers and differences of subsystems are relatively large, conflict between subsystems arises because each may struggle to obtain the scarce resources available (Scott and Davis, 2015). For example, Fürst *et al.* (2017) examine the extent to which an organization's multichannel differentiation influences its channel relationships. They assert that while multiple channels are, ideally, supposed to cooperate, they are often in some form of conflict in reality. Indeed, conflict is an inescapable part of every multichannel system (Webb and Didow, 1997). Both interchannel and intrachannel conflicts arise owing to the difficulty in explicitly defining product market boundaries and the responsibility of each channel. When a firm adds a new channel, existing channels inevitably resist in the face of rising internal and external competition for sales and customer retention (Webb and Didow, 1997).

Based on open systems theory, we consider a manufacturer and its multiple channels as an open system, with each of the firms as the subsystems. In this context, channel multiplicity represents the size and difference of the subsystems. The larger the difference in liabilities among multichannels, the higher the degree of channel multiplicity. When channel multiplicity is high, each channel seeks scarce resources, creating both horizontal conflict and vertical conflict. Open systems theory contends that because "an open system is in exchange of matter with its environment" (Von Bertalanffy, 1968, p. 149), environmental factors must be considered when determining the suitability of the organizational structure (Fürst *et al.*, 2017; Kast and Rosenzweig, 1985; Scott and Davis, 2015). Therefore, we include the ICT-related environment of the multichannel system in our framework, with a focus on IOS- and PSM-enabled interactions.

### **Impacts of channel multiplicity on channel conflict and performance**

Most manufacturers use various channels to reach and serve their customers (Käuferle and Reinartz, 2015; Kabadayi *et al.*, 2007). Phelps (2010) defines multiplicity as "the extent to

which a system consists of uniquely different elements, the frequency distribution of these elements, and the degree of difference among the elements” (p. 894). Accordingly, we define channel multiplicity as the variety of channel types used by manufacturers and distributors (Kabadayi *et al.*, 2007; Fürst *et al.*, 2017), which include conventional bricks-and-mortar channels, telemarketing and catalog marketing channels, and the more recent Internet, mobile, and PSM channels.

Manufacturers prefer higher channel multiplicity for several reasons. For example, given that customers have different sensitivities to and expectations of product designs, services, prices, and promotions, using a single channel to accommodate all customer needs is impossible and uneconomical. In this case, a hybrid of multiple distribution channels can be used to implement targeted production and marketing strategies according to the characteristics and requirements of different customer segments (Käuferle and Reinartz, 2015).

Despite these benefits, multichannel distribution poses challenges because it places higher demands on logistics, cross-channel services, control, and coordination. In this study, we focus on interfirm conflict in distribution channels and define channel conflict as the perception that a channel member’s goal achievement is obstructed by another member (Gaski and Nevin, 1985). Channel conflict includes both horizontal and vertical conflicts. Horizontal conflict occurs between distributors at the same level (e.g., between a manufacturer’s online and offline distributors in dealerships, retailing, or franchises), whereas vertical conflict arises in vertical arrangements between the upstream and downstream partners within a channel. In this study, we examine the conflict between a multichannel manufacturer and its distributors when examining vertical conflict.

Channel conflict can lead to customer dissatisfaction, sales deterioration, price wars, poor public relations, and low trust and commitment among members (Bai *et al.*, 2016). Serious channel conflict may lead to dysfunction, litigation, and, ultimately, the termination of interfirm

cooperation (Antia *et al.*, 2013). Coughlan *et al.* (2006) note that “most channel conflict is rooted in differences in a) channel members’ goals; b) their perception of the reality; and c) what they consider to be their domain or area where they should operate with autonomy” (p. 251). Previous studies have discussed the antecedents of channel conflict such as channel differentiation (Fürst *et al.*, 2017), channel behavior (Vinhas and Anderson, 2005), resource allocation (Neslin *et al.*, 2006), customer management (Neslin and Shankar, 2009), channel switching (Steinfield, 2002), and channel integration (Webb and Lambe, 2007). These studies have also explored the consequences of channel conflict, including channel selection (Neslin *et al.*, 2006), customer relations (Steinfield, 2002), and sales success (Fürst *et al.*, 2017). Table 2 summarizes the relevant literature.

Insert Table 2 about here

We posit that channel multiplicity is positively related to horizontal conflict. First, the concurrent use of multiple channels is likely to result in more issues and disputes among horizontal channel members (Coughlan *et al.*, 2006; Eshghi and Ray., 2021; Vinhas and Anderson., 2005). Based on open systems theory, the increased complexity of a channel system aggravates information asymmetry and makes it more difficult for manufacturers to observe, motivate, compensate, and coordinate channel members’ efforts (Frazier, 1999; Scott and Davis, 2015), thereby exacerbating horizontal conflict. In addition, channel multiplicity naturally creates overlapping markets, leading to (intra-brand) competition among channels. For example, a manufacturer’s “encroachment” (i.e., selling directly to end customers) can result in competition between direct and indirect channels, which induces horizontal conflict since every channel is likely to pursue its own interest at the expense of other channels and even try to exclude those other channels (Cui *et al.*, 2021; Fürst *et al.*, 2017; Scott and Davis, 2015; Vinhas and Anderson, 2005).

We also posit that channel multiplicity is positively related to vertical conflict. First, the

upstream and downstream partners within a channel are subject to information asymmetry, operate independently, and have different resources, perceptions and goals (Claro *et al.*, 2018). As a result, vertical conflict is inevitable because exchange partners play different roles in channels and often need to fight for the limited internal and external resources available (Eshghi and Ray, 2021). Second, vertical conflict may emerge when exchange partners perceive one another as threats to optimizing their performance and when communication difficulties hamper the achievement of their objectives (Claro *et al.*, 2018). Third, drawing on open systems theory, channel multiplicity increases the competitiveness between upstream and downstream partners, which makes resources scarce to obtain (Rosenbloom, 2007). The fight for scarce resources within a channel generates vertical frictions or disputes that frustrate both upstream and downstream partners.

Moreover, we propose that channel multiplicity enhances channel performance. Although adopting multiple channels can induce horizontal conflict among firms, an increasing number of manufacturers adopt a multichannel approach to expanding their market share and coverage. On the one hand, matching all types of products within a single channel is relatively complicated for manufacturers with various product lines and excess production capacity. Operating additional channels is conducive to increasing customers' purchases, adapting to customer needs and behaviors, expanding market scale, and improving channel performance (Jindal *et al.*, 2007). On the other hand, different customer segments have varying sensitivities to product types, prices, styles, materials, and promotions. The adoption of multiple channels helps firms conduct targeted product customization and precision marketing according to the characteristics and requirements of different customer segments to foster distribution intensity and improve channel performance (Käuferle and Reinartz, 2015). In light of our earlier discussion, we put forth the following hypothesis:

***Hypothesis 1.*** Channel multiplicity is positively related to (a) horizontal conflict, (b) vertical

*conflict, and (c) channel performance.*

### **Impacts of channel conflict on channel performance**

Because channel multiplicity aggravates both horizontal and vertical conflicts, it poses a serious challenge for multichannel manufacturers. Channel conflict has traditionally been thought to be a disrupting and dysfunctional force that places a significant strain on performance, as its consequences and the resource commitment required to managing such conflict are considerable (Dant and Schul, 1992; Bai *et al.*, 2016; Tsay and Agrawal, 2004; Brown *et al.*, 1983; Malhotra and Lumineau, 2011). In the same vein, multichannel conflict is also considered to be a destructive force (Fürst *et al.*, 2017; Tsay and Agrawal, 2004; Rosenbloom, 2007). For example, Fürst *et al.* (2017) suggest that manufacturers differentiate between segment-specific and task-specific responsibilities across diverse channels to mitigate horizontal and vertical conflicts. According to a meta-analysis of studies from 1960 to 2020, Eshghi and Ray (2021) find that most prior literature shows a negative effect of channel conflict on business performance/interfirm satisfaction for both individual firms<sup>1</sup> and joint channel outcomes. It is important to note that their meta-analysis is based only on conflict in vertical relationships and excludes cases of horizontal conflict.

Indeed, despite the general view of conflict as destructive and dysfunctional, the literature has long recognized its functional role (Lusch, 1976). Conflict is functional when the parties involved work together to resolve it constructively and achieve a common goal (Assael, 1969; Cronin and Baker, 1993). Functional conflict can raise performance, as firms may critically reappraise strategies, foster communication and grievance procedures, standardize conflict resolution methods, increase the sense of unity, and promote equitable resource distribution (Amason, 1996). Several studies have shown a positive link between performance and functional conflict in the context of marketing channels. Stern *et al.* (1996) argue that a channel system without conflict may lose viability, as channel members may become passive and fail

to innovate. Rosenbloom (1973) finds an inverted U-shaped relationship between conflict and channel performance, in which conflict is productive at moderate levels but unproductive at extreme levels.

In light of the above discussion, horizontal conflict could be positively related to channel performance for the following reasons. First, even when conflict is functional, disagreements and disputes among channel members increase their frustration, tension, and dissatisfaction with their relationships (Menon *et al.*, 1996; Hunt, 1995; Chang and Gotcher, 2010; Claro *et al.*, 2018). This means that a positive link between channel conflict and performance is more likely to arise when performance is measured economically than when it is measured attitudinally (e.g., satisfaction with the relationship) (Anderson and Narus, 1990). This view also appears to be supported by the finding of Eshghi and Ray's (2021) meta-analysis of a two-fold higher likelihood of a positive relationship between conflict and performance for economic performance than for satisfaction. Second, manufacturers may benefit from (a certain level of) channel conflict even when the entire channel suffers from it. If the conflict is beneficial, the manufacturer, rather than its distributors, is more likely to benefit from the conflict in terms of greater economic performance than other channel members because the former typically plays a central and proactive role in channel management.

Finally, multichannel manufacturers are more likely to benefit from increased horizontal conflict than from increased vertical conflict. As previously discussed, competition between distributors is a major driver of horizontal conflict. Intensified competition among a manufacturer's distributors can lower retail prices, which helps mitigate the double marginalization problem in the channel and increases sales of the manufacturer's product. Intensified competition can also prompt distributors to provide more retail services and invest more in promoting the manufacturer's product. Owing to these benefits, manufacturers are often motivated to induce competition among their distributors. Given the positive relationship

between distributor competition and horizontal conflict and between horizontal conflict and manufacturer performance, we propose the following hypothesis:

**Hypothesis 2.** (a) *Horizontal conflict is positively related to channel performance, and (b) vertical conflict is negatively related to channel performance.*

### **ICT-enabled interactions**

ICT-enabled interactions refer to the shared, evolving, and diverse set of ICT systems among various user communities, based on open and standardized interfaces (Racherla and Mandviwalla, 2013). Despite the increasing research on ICT implementation, few studies have explored the effects of interactions on various ICT platforms (e.g., IOS, PSM, software applications, emails, virtual conferencing, and corporate media) (Gal *et al.*, 2014; Mindel *et al.*, 2024; Tiilikainen *et al.*, 2024). We focus on IOS and PSM as the two types of platforms predominantly used by manufacturers (Zhu *et al.*, 2023; Cui *et al.*, 2020; Li *et al.*, 2020). In this context, IOS are the information infrastructure owned and planned by the manufacturer that operates at the organizational and interorganizational levels, whereas PSM is used by boundary spanners in the distribution channel, between the manufacturer and its distributors at both the individual and the interorganizational levels. Table 3 describes the characteristics of IOS- and PSM-enabled interactions.

Insert Table 3 about here

### ***IOS-enabled interactions***

IOS-enabled interactions refer to a manufacturer's reliance on its IOS to interpret and manipulate information for managerial processes and decision-making in routine interorganizational operations that coordinate partners' actions (Im and Rai, 2014; Kerr *et al.*, 2023). A manufacturer's IOS is a knowledge repository that remembers, retrieves, and distributes knowledge and information. Although a manufacturer's IOS can be interorganizational, it is owned, designed, and controlled by the manufacturer, and naturally

serves its self-interest.

The features of IOS-enabled interactions include communicating, storing, indexing, searching, matching, data processing, and applying analytics to large volumes of data, generating multiple interpretations by scanning, processing, and analyzing both existing and new information. Additionally, these interactions help refine partners' frameworks regarding their relationship's routines and goals (Hollebeek *et al.*, 2019). In practice, a manufacturer's IOS-enabled interactions entail good planning, long-term investment, and systematic measures to assist with formal procedures and strategies (Wu *et al.*, 2015). Typically, they combine data warehousing and analytics to generate various interpretations (Im and Rai, 2014). Therefore, we expect a positive link between IOS-enabled interactions and channel performance.

A more advanced IOS ensures superior computing power, data access, and processing capability, enabling managers to acquire, disseminate, and apply knowledge inside and outside the organization more quickly and efficiently to coordinate channels and increase performance. Using an advanced IOS also allows managers to better manage relationships with partner firms, coordinate activities, and increase the effectiveness of strategy formulation. Further, when the IOS-enabled interactions in a firm are high, partner firms' recognition, learning, and application of new knowledge are improved (Iyengar *et al.*, 2015).

### ***PSM-enabled interactions***

Social media allows the creation or exchange of information, ideas, and personal and career interests in virtual communities, thereby connecting people and helping them develop social networks (Arend *et al.*, 2014; Zhou *et al.*, 2022). Social media platforms share some common features, including their use of interactive communication and user-generated content (e.g., text posts, digital photos/videos, and data) (Li *et al.*, 2021). PSM is used by professionals in addition to personal purposes such as communication and entertainment in people's daily lives. For example, marketers use social media to connect with customers and partner firms and engage

them in building brands, driving traffic, and increasing sales (Arend *et al.*, 2014; Srinivasan *et al.*, 2022). Indeed, PSM platforms such as LinkedIn, Facebook, Twitter, WeChat, and WhatsApp, can support inter-organizational work processes (Aral *et al.*, 2013). Hence, PSM provides organizations and their employees with an alternative, informal way to exchange information and knowledge, complementing formal organizational information infrastructure (i.e., IOS-enabled interactions). It can also facilitate trust-building activities and business communication, enhance business intelligence, encourage the introduction of new techniques and processes to streamline operations, and reduce costs.

### **Roles of ICT-enabled interactions in channel conflict and performance**

While IOS-enabled interactions operate at the interorganizational level, PSM-enabled interactions are particularly used among the boundary spanners of the manufacturer and its distributors. An organization's IOS comprises its formal resources that standardize the process of information collection, analysis, storage, and sharing (Brockman and Morgan, 2006; Quinn *et al.*, 2016). Consequently, the information shared is usually formal, business-related, proprietary or secret, and is thus controlled and monitored by the organization (Wu *et al.*, 2015). The format is typically structured to foster the storage, collection, and dissemination of knowledge through various information systems (Iyengar *et al.*, 2015; Bandara *et al.*, 2021).

We posit that a manufacturer's IOS-enabled interactions facilitate the alignment and adaptation of channel members. In the multichannel distribution context, they are crucial for collecting information from and exchanging information with channel members. The routines developed through the IOS-enabled interactions of channel members should also accumulate over time, providing the multichannel distribution system with a more extensive set of tools to handle external stimuli (Im and Rai, 2014). In addition, IOS-enabled interactions provide changes in routines by allowing for detailed tracking of activities and issues when the desired outcome is not achieved, an unexpected outcome occurs, or new possibilities are revealed

(Hofacker *et al.*, 2020). IOS-enabled interactions, particularly the automation capabilities of IOS, structure the actions of channel members, which can help stabilize routines (Im and Rai, 2014). IOS coordinates the actions of channel members by establishing complex dependencies between event actions, clarifying members' roles and operational processes, and facilitating information exchange (Saraf *et al.*, 2007). In addition, IOS-enabled interactions enhance the coherence and adaptability of firms' automating processes, including the integration of planning and execution, deployment of visibility systems, and collaborative planning, forecasting, and replenishment (Im and Rai, 2014).

We posit that a manufacturer's IOS-enabled interactions have a negative relationship with vertical conflict. First, through the lens of open systems theory, an open system has external ICT-enabled interactions and embedded in an external environment (Fürst *et al.*, 2017; Kast and Rosenzweig, 1985; Scott and Davis, 2015). IOS-enabled interactions are crucial for helping collect and exchange information with external partners, which can allow firms to build and manage their relationships with partner firms and customers more effectively (Saraf *et al.*, 2007). Second, the IOS can recognize opportunities, facilitate problem-solving, and aid exchange partners' sensemaking, enabling them to holistically evaluate the relationship's decisions (Hofacker *et al.*, 2020). To help partners interpret different situations, IOS can process massive amounts of data and multiple representations of information as well as mine data and generate diverse views (Im and Rai, 2014). These repetitive interfirm routines connect partners to build a mutual understanding of their collaborative tasks. Third, IOS-enabled interactions can help develop shared mental models and enhance collaboration by challenging existing mental maps and solving interfirm problems. In summary, IOS-enabled interactions should mitigate horizontal and vertical conflicts, leading us to formulate the following hypothesis:

***Hypothesis 3.*** *A manufacturer's IOS-enabled interactions have a negative relationship with (a)*

*horizontal conflict and (b) vertical conflict.*

Compared with IOS-enabled interactions, PSM-enabled interactions are particularly effective at bolstering personal acquaintances and friendships, enhancing equality and interdependence, and improving the shared consciousness and trust environment (Weinberg *et al.*, 2013). For example, they enable unstructured, personal, interactive communication, which may be better suited to building social capital and developing tactics such as spotting and responding to unexpected events and emergencies. Specialized and tacit knowledge is highly valuable, but transferring it through partnerships can be difficult (Chen *et al.*, 2020). In this regard, PSM-enabled interactions provide direct and repeated access to tacit knowledge. Communication on PSM is often informal, spontaneous, sporadic, and timely. This modern, flexible, and casual communication style is suitable for exchanging novel market information and generating ideas (Weinberg *et al.*, 2013). PSM-enabled interactions can also reduce the disputes and misjudgments of channel members, which naturally arise because they are large competitors, thereby promoting mutual understanding. As a result, different channels can develop a clearer understanding of and more reasonable agreement on each other's position in the business (Linderman *et al.*, 2004), which helps check intra-brand competition, facilitates channel coordination, and reduces conflict.

For vertical channel relationships, high PSM-enabled interactions enable the instant transfer of information and quick decision making. First, communication through PSM-enabled interactions tends to be interactive, unstructured, personal, personalized, informal, and instant, which strengthens trust and thus reduces misunderstandings and risks in interorganizational relationships. Second, risks and exceptions such as supply shortages and late shipments, which are common vertical issues, can be identified and resolved more quickly and effectively by creating social networking groups across partner organizations.

Furthermore, PSM-enabled interactions, characterized by openness, expandability, and

interoperability, help improve existing routines and reduce reconfiguration costs. By leveraging these inherent flexibilities in PSM, exchange partners can adapt to the impetus for change by responding flexibly to the environment and reorganizing routines. In summary, PSM-enabled interactions can be used in distribution channels to build trust, relationships, and social capital; reduce misunderstandings and information asymmetry; and facilitate timely responses and collaboration. From the discussion above, we propose the following hypothesis:

***Hypothesis 4.*** *A manufacturer's PSM-enabled interactions have a negative relationships with (a) horizontal conflict and (b) vertical conflict.*

We have thus far argued that a manufacturer's IOS- and PSM-enabled interactions are negatively related to horizontal and vertical conflicts. For the next two hypotheses, we focus on the moderating effects of IOS- and PSM-enabled interactions on the relations between channel multiplicity and these two types of channel conflicts. To understand the interaction of IOS-enabled interactions with channel multiplicity, recall that channel multiplicity aggravates channel conflict for two main reasons. The first is the intensified competition between channels. The higher the channel multiplicity, the fiercer the competition and thus the more severe the conflict. The second reason is that channel multiplicity increases channel complexity, which relates to the increased information asymmetry in distribution channels. This higher information asymmetry makes it more difficult for the manufacturer to monitor, incentivize, regulate, and coordinate its channel members' activities, leading to both horizontal and vertical conflicts.

We argue that IOS-enabled interactions mitigate the positive effect of channel multiplicity on horizontal conflict. First, IOS-enabled interactions are useful when channel multiplicity is high, as they regularly and systematically provide explicit, precise, and well-structured knowledge and data (Linderman *et al.*, 2004), thereby increasing information transparency and helping the manufacturer acquire real-time information from multiple channels. Highly

accurate real-time information is conducive to multichannel coordination and supervision as well as mitigates competition.

Second, IOS-enabled interactions can help manufacturers alleviate the increased competition due to channel multiplicity. Advanced information systems and skilled personnel enable a manufacturer to collect more valuable data for seeking opportunities and formulating effective strategies (Byrd and Turner, 2000). This ability allows firms to formulate segment differentiation strategies that lower the competition between channels and thus mitigate horizontal conflict, even when channel multiplicity is high (Fürst *et al.*, 2017).

Third, IOS-enabled interactions can help manufacturers alleviate information asymmetry and better monitor and control channel partners to identify issues early (Hollebeek *et al.*, 2019). According to open systems theory, ICT-related interactions could impact an open system (Fürst *et al.*, 2017; Kast and Rosenzweig, 1985; Scott and Davis, 2015). A manufacturer benefitting from considerable IOS-enabled interactions can use its IOS to understand channels' operations, target markets, inventory, sales, pricing, and other strategies as well as share this information with its channel members as needed (Malhotra *et al.*, 2005). It can then moderate and resolve conflicts with reduced suspicion and misjudgment and increase information transparency across channels. Hence, we hypothesize the following:

***Hypothesis 5a.*** *A manufacturer's IOS-enabled interactions mitigate the positive relationship between channel multiplicity and horizontal conflict.*

We expect a manufacturer's IOS-enabled interactions to enhance channel multiplicity's adverse effect on vertical conflict, which, as discussed above, arises in vertical arrangements between the upstream and downstream partners within a channel (Fürst *et al.*, 2017). First, while manufacturers can use their IOS-enabled interactions to continually monitor distributors and punish misbehavior (Kozlenkova *et al.*, 2014), distributors may not like to be closely monitored, as it checks their ability to obtain information rent and conduct self-interested

opportunistic activities (Sheng *et al.*, 2018). This may lead them to underreport their operations, which limits their decision-making power and causes disputes, especially when channel multiplicity is high.

Second, IOS-enabled interactions require significant long-term investment and incur high transaction and information-sharing costs (Duong *et al.*, 2022). However, when the manufacturer invests in its IOS to manage its channels, distributors may be unwilling to bear this cost or disclose private information for fear of leakage, aggravating the manufacturer–distributor conflict. Information sharing economizes on high costs (e.g., the costs associated with communicating, incentivizing, and monitoring), as they incur investment, time, and effort (Grant and Phene, 2022). Even if these costs are negligible, interorganizational information sharing is rarely a given because of conflicts of interest among channel members and their strategic considerations.

Third, a manufacturer’s IOS-enabled interactions change the balance of decision-making power (Grant and Phene, 2022). Its internal knowledge resources complement a distributor’s market-based knowledge resources. Therefore, when IOS-enabled interactions are high, the manufacturer has more information power and control and depends less on the distributor, which increases the latter’s feeling of inequality and leads to vertical conflict. Hence, channel multiplicity gives rise to more knowledge- and information-related incidents and accidents; the more considerable the IOS-enabled interactions, the higher the number of incidences and accidents. Thus, we propose the following hypothesis:

***Hypothesis 5b.*** *A manufacturer’s IOS-enabled interactions strengthen the positive relationship between channel multiplicity and vertical conflict.*

While we expect PSM-enabled interactions to negatively affect channel conflicts overall, we argue that they have a positive moderating effect on the relation between channel multiplicity and channel conflicts; that is, PSM-enabled interactions aggravate the adverse

impact of channel multiplicity on both horizontal and vertical conflicts owing to their weaknesses in B2B contexts. This is because the knowledge shared on PSM is typically implicit, informal, emotional, and unstructured. First, considerable PSM-enabled interactions can create a large amount of unverified and/or false information, resulting in inconsistencies among the manufacturer's channels and exacerbating horizontal conflict with channel members. Since communication on PSM is personal and not monitored by organizations, users are not obligated to use precise language, as they are when using formal IOS. Consequently, individual conjectures, personal views, and imprecise and even wrong information are common on PSM.

Second, when a manufacturer's PSM-enabled interactions are considerable, integrating all the information from multiple channels is challenging, which causes chaos and horizontal conflict. Because information on PSM is often imprecise, elusive, and even misleading, it presents noisy signals and causes confusion, which makes it difficult for senior managers to use for making judgments and formulating strategies. These problems are aggravated when channel multiplicity is high.

Third, considerable PSM-enabled interactions increase the difficulty of multi-channel management for the manufacturer, especially as channels may perceive the information on PSM-enabled interactions differently. High channel multiplicity increases the complexity of the channel system, leading to significant differences and inconsistencies among channel members in the long run (Srinivasan *et al.*, 2022). Thus, we hypothesize the following:

***Hypothesis 6a.*** *A manufacturer's PSM-enabled interactions strengthen the positive relationship between channel multiplicity and horizontal conflict.*

We expect a manufacturer's PSM-enabled interactions to enhance channel multiplicity's adverse effect on vertical conflict. First, the manufacturer can continually monitor and control the distributor by using supervise behaviors through PSM-enabled interactions (Kozlenkova *et al.*, 2014; Strycharz *et al.*, 2019). When channel multiplicity is high, the channel system is

complex, with high information asymmetry and severe competition. In this case, the manufacturer has more coercive power when bargaining with distributors through PSM-enabled interactions, forcing them to purchase at higher prices and accept more sales risk. Under such high inequality, a distributor is more likely to care only about its own business because of coordination difficulties, causing vertical conflict.

Second, in line with the logic of open systems theory, a manufacturer operating within multiple channels depends less on any one channel and has more opportunities to select a cooperative partner distributor (Fürst *et al.*, 2017; Scott and Davis, 2015). This increases the pressure of communication and transactions, aggravating vertical conflict. Owing to unequal cooperation, the manufacturer can also assign more tasks to distributors through PSM-enabled interactions and monitor their performance, which causes disputes and vertical conflict.

Third, PSM-enabled interactions can be problematic when timely and formal procedures must be conducted to deal with operational issues owing to the credibility of the imprecise information often found on PSM. When the channel system is complex, the efficiency of the vertical channel is seriously lowered if it is loaded with unstructured and noisy information. In summary, when channel multiplicity is high and the system is complex, the weaknesses associated with PSM-enabled interactions become severe, as the noisy and misleading information on PSM causes confusion and reduces the manufacturer's efficiency when dealing with vertical issues in distribution channels. The discussion above leads us to hypothesize the following:

***Hypothesis 6b.*** *A manufacturer's PSM-enabled interactions strengthen the positive relationship between channel multiplicity and vertical conflict.*

## **Hypotheses testing**

### **Preliminary investigation**

We focused on manufacturers in China that are managing multichannel operations and using

ICT-enabled interactions to exchange information. This multichannel context is suitable for examining channel multiplicity, conflicts, and performance. Given the broad adoption of channel multiplicity by manufacturers in China, this type of firm can provide information on ICT-enabled interactions.

As a preliminary investigation, we interviewed 18 managers using the semi-structured interview method. The interviewees were MBA students from Hong Kong, China, who differed in age (range: 26–56 years) and position (e.g., managers, executives, and engineers). They possessed experience in relation to ICT from manufacturing and service firms. We conducted the semi-structured interviews using a template developed from insights from the ICT literature, along with the authors' academic and industry experience, to broaden the scope of our findings. The interview template included open-ended questions that addressed important topics related to ICTs. This format allowed interviewees to steer the conversation based on their responses and enabled the interviewer to ask more in-depth questions about key points of interest (Matthews *et al.*, 2022). Hence, using open-ended questions fostered deeper discussions, thus contributing to theory development (Wiesche *et al.*, 2017). Table 4 presents the interview template.

[Insert Table 4 about here](#)

Using the grounded theory methodology, we analyzed the interview transcripts to identify the two predominant platforms (i.e., IOS and PSM) for ICT-enabled interactions among contemporary firms and understand IOS- and PSM-enabled interactions in practice. The grounded theory methodology is a qualitative research approach that aims to develop inductive theories based on qualitative data such as interview transcripts (Corbin and Strauss, 1990; Walsh and Rowe, 2023). This methodology is frequently used in the IS literature (Guo *et al.*, 2024; Gerlach and Cenfetelli, 2020; Wiesche *et al.*, 2017). We chose this research methodology for two reasons. First, it is suitable for extracting theoretical insights from the interview

transcripts collected from managers that describe ICT-enabled interactions. Second, it can identify the critical components and characteristics associated with ICT-enabled interactions as well as the practices of IOS- and PSM-enabled interactions surrounding conflicts.

We analyzed the transcripts from the interviewees using the open coding, axial coding, and selective coding processes of the grounded theory methodology and coded the data using NVivo 12 (Corbin and Strauss, 1990; Walsh and Rowe, 2023). Open coding entails analyzing transcripts sentence-by-sentence and tracking open code numbers to assign preliminary conceptual labels of meaningful units (Gerlach and Cenfetelli, 2020; Mattarelli *et al.*, 2013). Following coding rules, we coded each sentence of the interview transcripts by interviewee, paragraph, and sentence. For example, we used [13-3-3, Solve conflict] to indicate that “When different channels conflict, IOS can quickly analyze the data of each channel, such as relevant customer and consumption data, and enterprises can modify and develop different online and offline marketing models according to the data.”

The interviewees confirmed the importance of ICT-enabled interactions on channel conflict. For instance, one interviewee said, “IOS would also allow staff of one particular channel to be more aware and more frequently updated on other channels’ actions, allowing the earlier detection of potential conflicts.” [6-2-4, detect potential conflict]. Another interviewee stated, “Good social media management can help organizations maintain better relationships internally and externally.” [7-5-1, Maintain better relationship]. Another added, “Social media can help them establish a closer relationship.” [7-7-3, Closer relationship]. Moreover, the interviewee also stated that “We can discuss identified problems and solutions immediately in WeChat, supplemented with emails; meetings are greatly reduced.” [10-1-4, Discuss solutions]. The open coding process concluded when a core category linking several related categories frequently reappeared (Sithambaram *et al.*, 2021).

Axial coding aims to connect categories with subcategories based on their shared

properties and thus establish links between categories (Wiesche *et al.*, 2017; Corbin and Strauss, 1990). We used axial coding to develop theoretical codes to enhance our understanding of the categories (Walsh and Rowe, 2023) and link the open coding results to established concepts. Selective coding involves developing codes linked to core categories, the central concepts to which all other categories are related (Corbin and Strauss, 1990). As our understanding deepened and intriguing themes emerged, we engaged in selective coding that focused on IOS- and PSM-enabled interactions, which subsequently emerged as significant constructs (Wiesche *et al.*, 2017).

### **Survey setting and data collection**

After these initial steps, we conducted a pilot survey and refined the questionnaire. The original questionnaire was in Chinese. To ensure clarity and accuracy, the authors translated the questionnaire into English and used the back-translation method, thereby guaranteeing that the concepts remained consistent and reliable. Back-translation is the primary method for translating scales, ensuring that the psychometric properties of the original scale are accurately preserved in its translated version (Klotz *et al.*, 2023). It involves two bilingual individuals. The process begins with one individual translating a scale from the source language to the target language. Then, a second bilingual individual translates the text back into the source language. The two translators, along with any involved researchers, compare the original source items with the translated ones. If any significant differences are found, the translated items are modified as necessary and the process is repeated as needed (Klotz *et al.*, 2023).

For the survey, we sampled 600 manufacturing firms in the period before the COVID-19 pandemic. These were selected from a business directory provided by China's National Bureau of Statistics. In selecting these firms, we tried to cover major and diverse industries and regions to ensure the samples were adequately representative and helpful to meet our research purpose. The sampled industries were distributed nationwide, with common long-term partnerships

between manufacturers and distributors. These firms were from the fabrics and apparel, machinery, medical equipment, electronic components, software, food and beverage, and other industries. The survey was conducted across various regions of China, including the southern, central, and northern areas, as well as both coastal and inland cities. This encompassed all first-tier cities and many second-tier cities. We targeted sales managers from manufacturers for the survey, as they possess valuable insights into their distribution channels, potential channel conflicts, and overall performance.

We chose a national marketing research company and recruited research assistants to conduct field surveys (Sheng *et al.*, 2018). The research assistants initially contacted respondents by phone and then followed up with in-person visits to conduct the survey. Although this approach was very costly, it ensured high data quality. Research assistants were able to reach the appropriate respondents and clarify the survey questions when needed (Sheng *et al.*, 2018). After excluding 80 incomplete questionnaires, we ultimately collected 520 valid responses, resulting in a response rate of 86.7%. Table 5 reports the sample demographics.

Insert Table 5 about here

### **Measurement development**

We rely on previously validated multi-item reflective scales for our constructs. Responses are provided on 7-point Likert scales with “1” representing “strongly disagree” and “7” “strongly agree.” First, following Käuferle and Reinartz (2015), we measure channel multiplicity using a three-item scale to capture channel types, diversification, and the use of direct and indirect channels. As manufacturers adopt various channel forms in the multichannel setting, the measurement items cover multiple channels. In addition, most manufacturers have an online sales channel operated by the manufacturers or their partners/distributors.

We measure horizontal conflict using a three-item scale adapted from Fürst *et al.* (2017) to capture inconsistencies and disputes among multiple channels and vertical conflict utilizing a three-item scale adapted from Bai *et al.* (2016) to capture inconsistencies and disputes

between manufacturers and their distributors. IOS-enabled interactions were measured by a three-item scale adapted from Byrd and Turner (2000), while PSM-enabled interactions were measured by a three-item scale adapted from Lam *et al.* (2016). These aim to evaluate the sales managers' use of IOS and PSM to communicate with channel members, respectively. Finally, three items for measuring channel performance are adopted from Fürst *et al.* (2017) and Claro *et al.* (2018), capturing the manufacturer's financial performance. Table 6 shows the measurement scales.

Insert Table 6 about here

We also control for potential effects of the following variables. We control for the manufacturer's sales revenue per year, as this influences channel performance (Fürst *et al.*, 2017). We control for relationship familiarity, which may influence channel relationships and performance. We control for contractual governance, relational governance (using scales adapted from Bai *et al.* (2016) and Sheng *et al.* (2018), respectively), coercive power, and joint problem-solving since these can impair vertical conflict and enhance both dyadic cooperation and channel performance. In addition, we control for industry-fixed effects on channel conflict and channel performance. Finally, we use two dummy variables: whether the firm is from the machinery industry (1 = machinery industry, 0 = other industry) and whether the firm is from the food and beverage industry (1 = food and beverage industry, 0 = other industry).

## **Analysis and results**

### **Reliability and validity**

We took several steps to verify the reliability and validity (see Table 6). We performed the exploratory factor analysis and confirmatory factor analysis. All factor loadings from the measurement items were significant on corresponding constructs ( $p < 0.001$ ) and ranged from 0.671 to 0.892, supporting convergent validity. In addition, the average variance extracted (AVE) ranges from 0.560 to 0.739, exhibiting good validity (Fornell and Larcker, 1981). Here, the  $\chi^2/d.f. = 2.472$ ,  $d.f. = 120$ ,  $GFI = 0.940$ ,  $RMSEA = 0.053$ , together indicating the adequate

model fit. Besides, the Cronbach's alpha ( $\alpha$ ) of our constructs ranged from 0.645 to 0.875, and the composite reliabilities (CR) ranged from 0.792 to 0.894, suggesting adequate reliability.

### **Common method bias**

To address the potential concern of common method bias, we chose a variable that measures the respondent's working years in the firm as the method variance marker, which provided the lowest correlation ( $r = 0.023$ ) with other variables (Poppo *et al.*, 2016). The results indicate that all significant correlations remain consistent after adjusting the MV marker (see Table 7). Therefore, common method bias is rather limited in this research.

Insert Table 7 about here

### **Endogeneity test**

To address the potential endogeneity problem, we first conducted the Durbin–Wu–Hausman specification test on the two suspected endogenous variables (i.e., IOS- and PSM-enabled interactions). The results were found to be not significant ( $F_{\text{horizontal conflict}} = 4.318, p = 0.115, p > 0.05$ ;  $F_{\text{vertical conflict}} = 2.427, p = 0.297, p > 0.05$ ), indicating that IOS- and PSM-enabled interactions are exogenous in our research model. Hence, the endogeneity problem does not appear to be a serious concern (Davidson and MacKinnon, 1993). Further, we applied an instrumental variable approach to conduct the endogeneity test using the survey and secondary regional economic development data (i.e., institutional development data). Specifically, we used institutional development, interpersonal guanxi, and non-coercive power as the instrumental variables. Institutional development is based on the secondary data from the marketization index of China's provinces (NERI report). The correlations are listed in Table 8.

Insert Table 8 about here

All of the six correlations are significant at 0.05, fulfilling the instrument variables' relevance requirement. Both instruments are significantly correlated with IOS- and PSM-enabled interactions. Institutional development, interpersonal guanxi, and non-coercive power

are not significantly correlated with the residuals. Hansen's J-statistic also rejects the null, indicating those instruments are valid. The regression results are reported in Table 9. In this table, Models 1 and 4 report the results with a control function approach to treat the endogeneity problem. Models 2 and 5 report the results with the endogeneity treatment using predicted values of IOS- and PSM-enabled interactions (2SLS). Models 3 and 6 report the results without treating endogeneity. The results indicate that the qualitative nature of the regression results does not change, whether the endogeneity problem is treated or not. We, therefore, use the ordinary least squares (OLS) regression model in the following analysis.

Insert Table 9 about here

## **Results**

The OLS estimation results are shown in Tables 10 and 11. Models 1 and 3 are main-effect models, and Models 2 and 4 (full) are moderation-effect models. Models 1 and 3 show that channel multiplicity is positively related to horizontal and vertical conflicts ( $\beta = 0.147, p < 0.001$ ;  $\beta = 0.137, p < 0.001$ ), supporting H1a and H1b. The estimation result of Model 6 in Table 11 suggests that channel multiplicity can enhance channel performance ( $\beta = 0.126, p < 0.01$ ). Therefore, horizontal conflict, vertical conflict, and channel performance increase as channel multiplicity increases.

Models 1 and 3 in Table 10 show the main effects of IOS- and PSM-enabled interactions on channel conflict. The coefficients are mostly negative and significant, as we expected. IOS-enabled interactions is negatively related to horizontal conflict ( $\beta = -0.104, p < 0.05$ ) and vertical conflict ( $\beta = -0.090, p < 0.05$ ), supporting H3a and H3b. Model 7 in Table 11 shows that IOS-enabled interactions positively relates to channel performance ( $\beta = 0.171, p < 0.001$ ). In Models 1 and 3, PSM-enabled interactions is negatively related to horizontal conflict ( $\beta = -0.155, p < 0.001$ ) and vertical conflict ( $\beta = -0.152, p < 0.01$ ), supporting H4a and H4b. The effect of PSM-enabled interactions on channel performance is not significant in Model 7. As

for the moderation effects, the interaction between channel multiplicity and IOS-enabled interactions on horizontal conflict (Model 2) is negative ( $\beta = -0.134, p < 0.01$ ), and that on vertical conflict (Model 4) is positive ( $\beta = 0.127, p < 0.001$ ), in support of H5a and H5b. Moreover, the interaction between channel multiplicity and PSM-enabled interactions on horizontal conflict is positive ( $\beta = 0.085, p < 0.05$ ), and that on vertical conflict is positive ( $\beta = 0.100, p < 0.05$ ), in support of H6a and H6b.

Insert Table 10 about here

We now examine how channel multiplicity and channel conflict influence channel performance (see Table 11). Model 5 shows that vertical conflict is negatively related to channel performance ( $\beta = -0.105, p < 0.05$ ), supporting H2b. Still, horizontal conflict positively affects channel performance ( $\beta = 0.080, p < 0.05$ , one-tailed), supporting H2a. Model 6 shows that channel multiplicity is positively related to channel performance ( $\beta = 0.126, p < 0.01$ ), in support of H1c. To understand the latter finding, one needs to note that it is in the manufacturer's interest to keep competition between its distributors at certain levels. Maintaining a healthy level of intra-brand competition strikes a balance between motivating distributors to promote sales (e.g., by providing promotional activities such as services, advertising, and price discounts) and helping the manufacturer defend against inter-brand competition with other manufacturers. As for the control variables, sales revenue and contractual governance are positively related to horizontal and vertical conflicts. However, relational governance is negatively related to horizontal and vertical conflicts. Contractual governance is also significantly and positively related to channel performance.

Insert Table 11 about here

In the Appendix, we illustrate the moderation effects of IOS- and PSM-enabled interactions on horizontal and vertical conflicts (Aiken and West, 1991). Graph A shows that IOS-enabled interactions negatively moderate the effect of channel multiplicity on horizontal

conflict, so both the direct and overall relation of IOS-enabled interactions and horizontal conflict are negative. In sharp contrast, graph B indicates that though IOS-enabled interactions have a negative, direct relation with vertical conflict, their overall relation turns positive due to a strong positive interaction between IOS-enabled interactions and channel multiplicity, as long as channel multiplicity is not too low. Graphs C and D show that in the same vein, though PSM-enabled interactions have a negative, direct relation with horizontal and vertical conflicts, the overall relations turn positive when channel multiplicity is not too low. Graphs C and D also show that when channel multiplicity is low, no matter how much PSM-enabled interactions is used, it has a non-significant moderating effect on channel conflict (6.522 and 6.614 from graph C; 6.658 and 6.806 from graph D).

We further examined how the effects of the IOS- and PSM-enabled interactions are mediated through horizontal and vertical conflicts. The results in Table 12 suggest that the effect of IOS-enabled interactions on channel performance is partially mediated through vertical conflict.

Insert Table 12 about here

## **Discussion**

Drawing on open systems theory, this study examines the impacts of channel multiplicity and ICT-enabled interactions on conflicts and performance as well as the moderating roles of IOS- and PSM-enabled interactions on the relationship between channel multiplicity and conflict. Using survey data from 520 industrial manufacturers and regional economic development data, we find that channel multiplicity positively affects channel conflict and performance. Further, horizontal conflict positively affects channel performance, whereas vertical conflict negatively affects channel performance. More interestingly, despite the negative direct relationships between both IOS- and PSM-enabled interactions and channel conflict, the overall relationships are positive because of the strong positive interaction effects between the

interactions and channel multiplicity. Specifically, IOS-enabled interactions strengthen the positive effect of channel multiplicity on vertical conflict, whereas PSM-enabled interactions strengthen the positive effect of channel multiplicity on both horizontal and vertical conflicts. Our findings thus shed light on the complex roles of IOS- and PSM-enabled interactions and suggest that channel managers must leverage different interaction platforms to manage multichannel conflict.

### **Theoretical implications**

This research makes a significant theoretical contribution to the literature. First, we employ open systems theory to examine the effects of channel multiplicity on horizontal and vertical conflicts. It is the first in-depth investigation that delineates multichannel conflict from a channel structure perspective. Prior studies such as that by Käuferle and Reinartz (2015) have merely highlighted the importance of different channels in generating mixed types of channel conflicts or explored the impact of firms adopting diversified channels on channel usage, channel cooperation, and information asymmetry as well as the moderating effects of channel governance, information exchange, and customer characteristics (Fürst *et al.*, 2017; Gao *et al.*, 2021; Homburg *et al.*, 2020). Our research extends the open systems theory literature by showing that channel multiplicity acts as a driver of horizontal and vertical conflicts. Our findings shed light on the organizational structure that improves the potential gains from multichannel management (Neslin and Shankar, 2009), confirming the presumption of Fürst *et al.* (2017) that the organizational structure of multichannel distribution systems influences the relationships among sales channels.

Second, we find that whereas vertical conflict is detrimental to a manufacturer's profitability, its financial performance can be improved through increased horizontal conflict among channel members. Previous studies have focused on the internal relationship between the multichannel system and channel conflict. For example, Webb and Lambe (2007) propose an integrated hybrid channel conflict model to synthesize channel structures in developed

countries. Fürst *et al.* (2017) use open systems theory to examine whether and how channel differentiation affects channel conflict. However, although prior studies have examined several ways to decrease multichannel conflict and improve performance (e.g., channel differentiation, trust, and dependence among members) (Eshghi and Ray, 2021; Webb and Lambe, 2007), few have investigated the different impacts of horizontal and vertical conflicts on channel performance. Moreover, most marketing studies focus on the negative effect of conflict on performance and consider it as a disruptive and dysfunctional force that must be resolved and reduced (Dant and Schul, 1992; Fürst *et al.*, 2017). Yet our findings indicate that the perspective may be partial as conflict can also enhance channel performance (Claro *et al.*, 2018; Hunt, 1995). Our research suggests that firms should distinguish between vertical and horizontal conflicts and manage them accordingly. While it is advisable to mitigate vertical conflict, maintaining or even increasing horizontal conflict can be beneficial in multichannel distribution.

Third, we examine the concurrent use of IOS and PSM as the two platforms predominantly used by firms to interact in contemporary settings. Prior information systems studies on ICT-enabled interactions have focused on the overall effects, without distinguishing between these platforms (Cuevas-Vargas *et al.*, 2022; Millán *et al.*, 2021; Pradhan *et al.*, 2021). However, we distinguish between IOS- and PSM-enabled interactions for channel managers use these two platforms to share different types of information. We argue that the knowledge acquired and shared on IOS and PSM platforms has different characteristics. While previous research has explored the impact of IOS-enabled interactions within organizations (Ayabakan *et al.*, 2017; Rai *et al.*, 2012), research at the interorganizational level is limited. Similarly, prior studies on PSM-enabled interactions have investigated the interactions between firms and customers (Aral *et al.*, 2013; Valizadeh and Rahimzadeh, 2021), with little attention paid to those among the boundary spanners in a channel. Therefore, our study contributes to the body of literature by empirically demonstrating the different impacts of IOS- and PSM-enabled interactions on horizontal and vertical conflicts. To the best of our knowledge, we present novel empirical evidence that IOS- and PSM-enabled interactions, if managed well, can be used differently by

firms to address channel conflict. Hence, applying ICT to manage multichannel conflict and translate ICT's potential into economic value is worthwhile.

Fourth, we establish a boundary condition for reducing channel conflict. Prior studies such as Fürst *et al.* (2017) have shown that ICT can be introduced to coordinate multiple channels to mitigate conflict, but have not empirically examined the effect of ICT on channel conflicts. Moreover, Claro *et al.* (2018) examine the positive effect of functional conflict and multichannel conflict management on fostering the supplier–reseller relationship in the ICT industry without investigating ICT-specific variables. Our findings echo the arguments of Fürst *et al.* (2017) and Claro *et al.* (2018) by highlighting that IOS-enabled interactions have a negative interaction effect with channel multiplicity on horizontal conflict and a positive interaction effect with channel multiplicity on vertical conflict. However, PSM-enabled interactions have a positive interaction effect with channel multiplicity on both horizontal and vertical conflicts. These findings confirm our central contention that increased IOS- and PSM-enabled interactions can cause more channel conflict as long as channel multiplicity is not too low. The only exception is that IOS-enabled interactions have a negative interaction effect with channel multiplicity on horizontal conflict. Furthermore, we add to the information systems literature by revealing that IOS- and PSM-enabled interactions improve channel performance via affecting channel conflict. The findings show both the direct and indirect effects of IOS- and PSM-enabled interactions on channel conflicts and performance, consistent with the presumptions of Scott and Davis (2015) and Kabadayi *et al.* (2007). This insight has rich managerial implications for distribution channel managers to better design and use new technologies in the age of digital transformation.

Finally, our research aligns with the recommendations of Venkatesh *et al.* (2023), who emphasize the importance of integrating qualitative and quantitative insights. Using the grounded theory approach, we identify IOSs and PSM as two key platforms for ICT-enabled

interactions. These IOS- and PSM-enabled interactions can help check and resolve conflicts. Based on the findings from our grounded theory study, we developed and tested our hypotheses by analyzing survey and regional economic development data. Hence, the relationships in our research framework are validated by both qualitative and quantitative data and our qualitative and the quantitative analyses yielded consistent conclusions. Previous studies have focused on the overall impact of ICT without clearly differentiating between the various platforms (Cuevas-Vargas *et al.*, 2022; Millán *et al.*, 2021; Pradhan *et al.*, 2021). Our research contributes to the literature by integrating both qualitative and quantitative insights to highlight the distinct characteristics of IOS- and PSM-enabled interactions and their differing moderating roles in conflict management.

### **Managerial implications**

This study offers valuable guidance for manufacturers in managing multichannel conflict and promoting performance. First, we explain how multichannel managers can mitigate horizontal and vertical conflicts through ICT adoption. Our conceptual framework incorporates the relationships among channel multiplicity, conflicts, ICT-enabled interactions, and channel performance, enabling us to show that horizontal conflict increases channel performance. Manufacturers' channel managers are better informed of the fact that horizontal conflict also has positive aspects. Manufacturers do not need to eliminate horizontal conflict; instead, they can encourage healthy competition among channel members and leverage ICT to enhance the ICT-enabled interactions among them (John and Scheer, 2021).

Second, the emergence of ICT in recent decades has fostered a myriad of multichannel operations (Eshghi and Ray, 2021), leading manufacturers to change significantly. In particular, many manufacturers have rapidly developed and adopted IOS for use among their upstream and downstream partners. The findings of this research highlight that IOS-enabled interactions attenuate the positive relationship between channel multiplicity and horizontal conflict, but

strengthen the positive relationship between channel multiplicity and vertical conflict. When manufacturers prioritize the reduction of horizontal conflict, they must enhance the role of IOS-enabled interactions to diminish the positive relationship between channel multiplicity and horizontal conflict. As IOS remove barriers to business operations and offer more opportunities, manufacturers should exploit this technological resource to alleviate vertical conflict and improve performance in the era of digital transformation. Moreover, policymakers and governments should encourage investment in IOS to promote societal transformation and increase firm performance across regions.

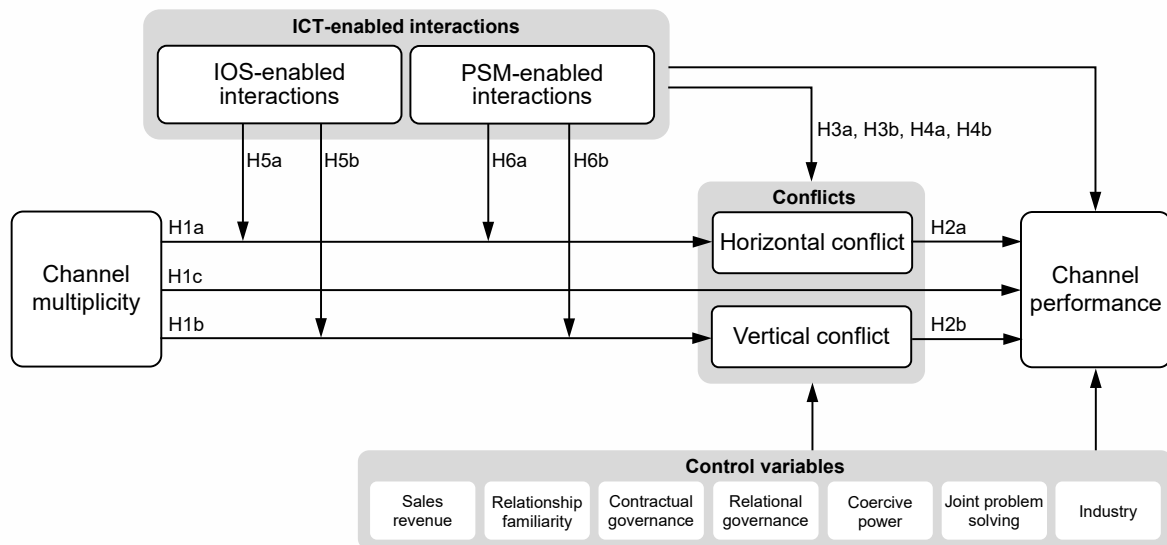
Third, the COVID-19 pandemic has altered how businesses operate (Alalwan *et al.*, 2021), changing the dynamics of production, marketing, and management for Chinese manufacturers. For this reason, PSM has become crucial for manufacturers' sales and marketing activities as well as for communicating with stakeholders (Guesalaga, 2016). However, while managers are increasingly adopting PSM to forge cooperation with channel members, only 4% of firms obtain substantial returns on their PSM investments (Hewett *et al.*, 2016). Further, some managers remain concerned that using PSM may harm their work/life balance and create confusion, uncertainty (due to the low reliability of information on PSM), and the leakage of sensitive information. Although PSM usage can be beneficial, our data analysis shows that it can have detrimental effects on horizontal and vertical conflicts. Managers should thus be cautious when using PSM to reduce channel conflict and be aware that information on PSM is typically informal and unstructured, which may delay dispute solving and knowledge exchange through formal processes. The effective use of various digital technologies is attributed to their complementary and supplementary uses (Plangger *et al.*, 2022).

### **Limitations and future research directions**

This research has limitations that future research could address. First, while utilizing manufacturer data is pertinent in this context, the results reflect the manufacturers' perceptions

regarding channel multiplicity, conflicts, ICT-enabled interactions, and channel performance. Future studies could gather data from multiple sources, including manufacturers, distributors, and other stakeholders, to gain a more comprehensive understanding of varied perceptions in practice. Second, IOS and PSM-enabled interactions may affect other aspects of business operations and relationships. Future research should thus examine the potential role of both types of interactions in channel collaboration, dependence, and governance. Third, while this study investigated the moderating impacts of ICT-enabled interactions on channel conflict, future studies could consider other contingency factors such as environmental, channel-related, and market factors. Finally, due to the evolving nature of relationships among channel multiplicity, conflicts, ICT-enabled interactions, and channel performance, we suggest future longitudinal studies to examine the dynamics of these relationships for deeper insights.

**Figure 1.** Research framework



**Table 1.** Overview of constructs

Construct labels	Construct definitions	Main references
Channel multiplicity	The manufacturer uses a variety of channels to reach and serve customers, such as brick-and-mortar stores, direct marketing channels, online website channels, and mobile channels.	Kabadayi <i>et al.</i> (2007)
Horizontal conflict	Conflicts between different distribution channels in the multichannel context.	Webb and Lambe (2007); Fürst <i>et al.</i> (2017)
Vertical conflict	Conflicts between the upstream and downstream partners within a channel in the multichannel context.	Webb and Lambe (2007); Fürst <i>et al.</i> (2017)
IOS-enabled interactions	A manufacturer's reliance on its IOS to interpret and manipulate information for managerial processes and decision-making in routine interorganizational operations that coordinate partners' actions.	Im and Rai (2014)
PSM-enabled interactions	A manufacturer's reliance on PSM allows the creation or exchange of information, ideas, personal and career interests, and so on in virtual communities.	Arend <i>et al.</i> (2014)
Channel performance	The manufacturer's financial performance.	Fürst <i>et al.</i> (2017)

**Table 2.** Relevant research on channel conflict in the multichannel context

Authors	Main contents	Independent variables	Mediating or moderating variables	Dependent variables
Dong and Lu (2022)	impact of channel conflict on cross-channel integration	the strength of channel conflict	channel fluency, channel stability	cross-channel integration
Claro <i>et al.</i> (2018)	channel conflict and performance in a multichannel setting	functional conflict, dysfunctional conflict	conflict management	channel performance
Fürst <i>et al.</i> (2017)	impact of multichannel differentiation on channel conflict	channel differentiation, segment differentiation, task differentiation	horizontal conflict, vertical conflict, cooperation, customer characteristics	sales success
Neslin and Shankar (2009)	issues, prospects, and suggestions for multi-channel customer management	marketing communication, promotions, branding, customer information system	channel supply, marketing activities	channel selection, channel conflict, sales performance
Webb and Lambe (2007)	impact of market orientation and channel integration on channel conflict	internal market orientation, internal channel coalition	internal channel conflict, product life cycle	internal channel performance, external channel conflict
Neslin <i>et al.</i> (2006)	multichannel customer management	customer data integration, consumer behavior, resource allocation, channel coordination strategy	channel conflict management	customer loyalty, sales, channel selection
Vinhas and Anderson (2005)	use of direct and distribution channels to serve one geographical market	consumer differentiation, consumer growth, buying behavior, perception	channel differentiation pricing, manufacturer ownership	channel usage, disruptive conflicts
Steinfield (2002)	potential synergies arising from the integration of e-commerce with traditional channels	channel integration, IT infrastructure, employee revenue, channel switching	channel conflict	coordination, control, investment, customer relation

**Table 3.** Characteristics of IOS- and PSM-enabled interactions

	IOS-enabled interactions	PSM-enabled interactions
Examples	ERP, EDI, CRM, POS, SCM, workflow automation, and lotus notes, etc.	LinkedIn, Facebook, Twitter, WeChat, and WhatsApp, etc.
Platform	IOS	PSM
Interactive interface	human to computer	human to human
Speed of interaction	high response speed	slow response speed
Degree of interaction	low customization	high customization
Scope of interaction	not flexible, inter-firm	flexible, inter-firm, or between personnel
Investment	high investment	free
Process control	high intervention and control	low intervention and control
Ownership	owned by the firm	owned by social media organizations to serve the public
Information	structured	unstructured

**Table 4.** Interview template

Please share your thoughts and experiences with me by answering the following open-ended questions. It will take about 15 to 30 minutes. Please just share your views; there are no correct or wrong answers.

1. Discuss the application of ICT in your work and life.
2. Share your understanding of ICT.
3. When a firm has multiple channels of different types, such as online channels (Taobao, JD, firm official website, etc.), offline channels (offline physical stores, dealers, wholesalers, etc.), social media channels (TikTok live stream), etc., how to integrate various channels through ICT?
4. How to avoid conflict when using multiple channels?

**Table 5.** Sample demographics

Characteristic	Mfrs	%	Characteristic	Mfrs	%		
Industry	fabrics and apparel	48	9.2	Firm size (million)	< 5	130	25.0
	machinery	90	17.3		5-24.99	211	40.6
	medical equipment	59	11.3		25-49.99	111	21.3
	electronic components	64	12.3		50-99.99	42	8.1
	food and beverage	50	9.6		100-299.99	15	2.9
	software	38	7.3		> 299.99	11	2.1
	other	171	33.0				
Relationship length (years)	< 2	155	29.8	Working years in the firm	< 2	111	21.3
	2-5	257	49.4		2-5	259	49.9
	> 5	108	20.8		> 5	150	28.8

**Table 6.** Measurement scales

Variables	Items	Factor loadings
Channel multiplicity Cronbach's $\alpha=0.758$ ; CR=0.864; AVE=0.680	Our firm has adopted many different types of channels to sell products.	0.872
	The sales channels of our firm are diversified.	0.874
	Our firm has traditional distributor channels and online stores to sell products.	0.719
IOS-enabled interactions Cronbach's $\alpha=0.795$ ; CR=0.863; AVE=0.677	Our firm's IOS is connected to the distributor's IOS, and we exchange data frequently.	0.857
	The business staff of our firm and the distributor often obtain progress in cooperation projects through IOS.	0.842
	The business staff of our firm and the distributor often check the real-time production and sales data related to our products through IOS.	0.767
PSM-enabled interactions Cronbach's $\alpha=0.645$ ; CR=0.795; AVE=0.565	Our firm's business staff can use PSM (such as WeChat, Weibo, online community, QQ, etc.) to negotiate orders with the distributor's business staff.	0.775
	Our firm's business staff can use PSM to inquire about inventory, production, or sales information with the distributor's business staff.	0.772
	Our firm's business staff can use PSM to send notices related to the cooperation between the two parties with the distributor's business staff.	0.705
Horizontal conflict Cronbach's $\alpha=0.875$ ; CR=0.893; AVE=0.735	There are often inconsistencies in interests among multiple channels of our firm on some important issues.	0.835
	There are often conflicts of interest among multiple channels of our firm.	0.889
	Coordinating the interests of our firm among multiple channels is relatively complicated.	0.847
Vertical conflict Cronbach's $\alpha=0.825$ ; CR=0.854; AVE=0.662	Some of the distributor's behavior has increased the difficulty proceeding with our firm's work.	0.872
	Some of the distributor's actions have prevented our firm from achieving our goals.	0.850
	On some important issues, our firm has conflicting interests with the distributor.	0.710
Channel performance Cronbach's $\alpha=0.662$ ; CR=0.796; AVE=0.566	Our firm's return on investment is higher than that of our main competitors.	0.774
	Our firm's sales growth rate is higher than that of our main competitors.	0.805
	Our firm's market share is higher than that of our main competitors.	0.672

Note: The vast majority of the manufacturers in China have online presence, with either a real online store in their websites or a sales channel/contact (e.g., via a link) operated by their distributors or other partners. As O2O has been so popularly developed in China in recent years, people and our survey participants generally have a rather broader interpretation of an online store than the "traditional" manufacturers' online store format.

**Table 7.** Means, standard deviations, and correlations

	1	2	3	4	5	6
1. Channel multiplicity		0.085	0.043	0.122**	0.081 <sup>†</sup>	0.181***
2. IOS-enabled interactions	0.085 <sup>†</sup>		0.031	-0.129**	-0.152***	0.325***
3. PSM-enabled interactions	0.043	0.031		-0.270***	-0.244***	0.082 <sup>†</sup>
4. Horizontal conflict	0.122**	-0.129**	-0.270***		0.484***	-0.013
5. Vertical conflict	0.081 <sup>†</sup>	-0.152***	-0.244***	0.484***		-0.141**
6. Channel performance	0.181***	0.325***	0.082 <sup>†</sup>	-0.013	-0.141**	
7. Method variance marker	-0.025	-0.018	-0.084	-0.038	0.023	0.024
Mean	4.568	4.762	3.762	3.526	3.031	4.828
Standard deviation	1.236	1.015	0.686	1.379	1.207	0.735

Note: \*\*\*  $p < 0.001$  (two-tailed), \*\*  $p < 0.01$  (two-tailed), \*  $p < 0.05$  (two-tailed), <sup>†</sup>  $p < 0.05$  (one-tailed).

**Table 8.** Correlations

	IOS-enabled interactions	PSM-enabled interactions	Residual_HC	Residual_VC	Inst. dev.	Interpers. guanxi	Non-coercive power
IOS-enabled interactions		0.031	0.000	0.000	-0.188***	0.353***	0.156***
PSM-enabled interactions	0.031		0.000	0.000	0.090*	-0.097*	0.386***
Residual_HC	0.000	0.000		0.437***	-0.014	-0.056	-0.064
Residual_VC	0.000	0.000	0.437***		-0.077	-0.055	-0.053
Institutional development	-0.188***	0.090*	-0.014	-0.077		-0.109*	0.066
Interpersonal guanxi	0.353***	-0.097*	-0.056	-0.055	-0.109*		-0.069
Non-coercive power	0.156***	0.386**	-0.064	-0.053	0.066	-0.069	

Note: \*\*\*  $p < 0.001$  (two-tailed), \*\*  $p < 0.01$  (two-tailed), \*  $p < 0.05$  (two-tailed), †  $p < 0.05$  (one-tailed).

**Table 9.** Impact of IOS- and PSM-enabled interactions on conflict

Variable	Horizontal conflict			Vertical conflict		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	8.029*** (0.000)	3.526*** (0.000)	6.320*** (0.000)	6.610*** (0.000)	3.031*** (0.000)	5.435*** (0.000)
IOS-enabled interactions (IOS)	-0.354** (0.009)		-0.164** (0.004)	-0.257* (0.030)		-0.172*** (0.001)
$\widehat{IOS}$		-0.154* (0.011)	-0.534*** (0.000)		-0.112* (0.035)	
PSM-enabled interactions (PSM)	-0.749*** (0.001)			-0.626*** (0.001)		-0.422*** (0.000)
$\widehat{PSM}$		-0.204*** (0.001)			-0.170** (0.001)	
Residual_IOS	0.217 (0.112)			0.100 (0.406)		
Residual_SM	0.166 (0.261)			0.155 (0.232)		
R <sup>2</sup>	0.095	0.039	0.087	0.085	0.032	0.080

Note: \*\*\*  $p < 0.001$  (two-tailed), \*\*  $p < 0.01$  (two-tailed), \*  $p < 0.05$  (two-tailed), †  $p < 0.05$  (one-tailed).

**Table 10.** OLS regression estimates

Dependent variables	Horizontal conflict		Vertical conflict	
	Model 1	Model 2	Model 3	Model 4
<i>Direct effects</i>				
Channel multiplicity	0.147*** (0.045)	0.115** (0.046)	0.137*** (0.040)	0.127** (0.040)
IOS-enabled interactions	-0.104* (0.062)	-0.052 (0.064)	-0.090* (0.054)	-0.119* (0.056)
PSM-enabled interactions	-0.155*** (0.093)	-0.147** (0.092)	-0.152** (0.081)	-0.151** (0.080)
<i>Moderating effects</i>				
Channel multiplicity × IOS-enabled interactions		-0.134** (0.052)		0.127*** (0.045)
Channel multiplicity × PSM-enabled interactions		0.085* (0.054)		0.100* (0.047)
<i>Control variables</i>				
Sales revenue	0.219*** (0.049)	0.212*** (0.048)	0.142*** (0.043)	0.150*** (0.042)
Relationship familiarity	-0.024 (0.060)	-0.027 (0.060)	0.006 (0.052)	-0.010 (0.052)
Contractual governance	0.140** (0.077)	0.140** (0.076)	0.082† (0.067)	0.077 (0.067)
Relational governance	-0.120** (0.077)	-0.147*** (0.077)	-0.223*** (0.067)	-0.212*** (0.067)
Coercive power	-0.047 (0.075)	-0.042 (0.076)	0.103* (0.066)	0.129** (0.066)
Joint problem solving	-0.167*** (0.086)	-0.151** (0.086)	-0.156*** (0.075)	-0.183*** (0.076)
Food and beverage industry	0.034 (0.192)	0.042 (0.191)	0.022 (0.168)	0.007 (0.167)
Machinery industry	-0.043 (0.149)	-0.056 (0.148)	-0.044 (0.130)	-0.033 (0.129)
R <sup>2</sup>	0.208	0.229	0.208	0.229
Adjusted R <sup>2</sup>	0.190	0.209	0.191	0.209
Model F	12.095***	11.534***	12.126***	11.535***

Note: \*\*\*  $p < 0.001$  (two-tailed), \*\*  $p < 0.01$  (two-tailed), \*  $p < 0.05$  (two-tailed), †  $p < 0.05$  (one-tailed).

**Table 11.** OLS regression estimates

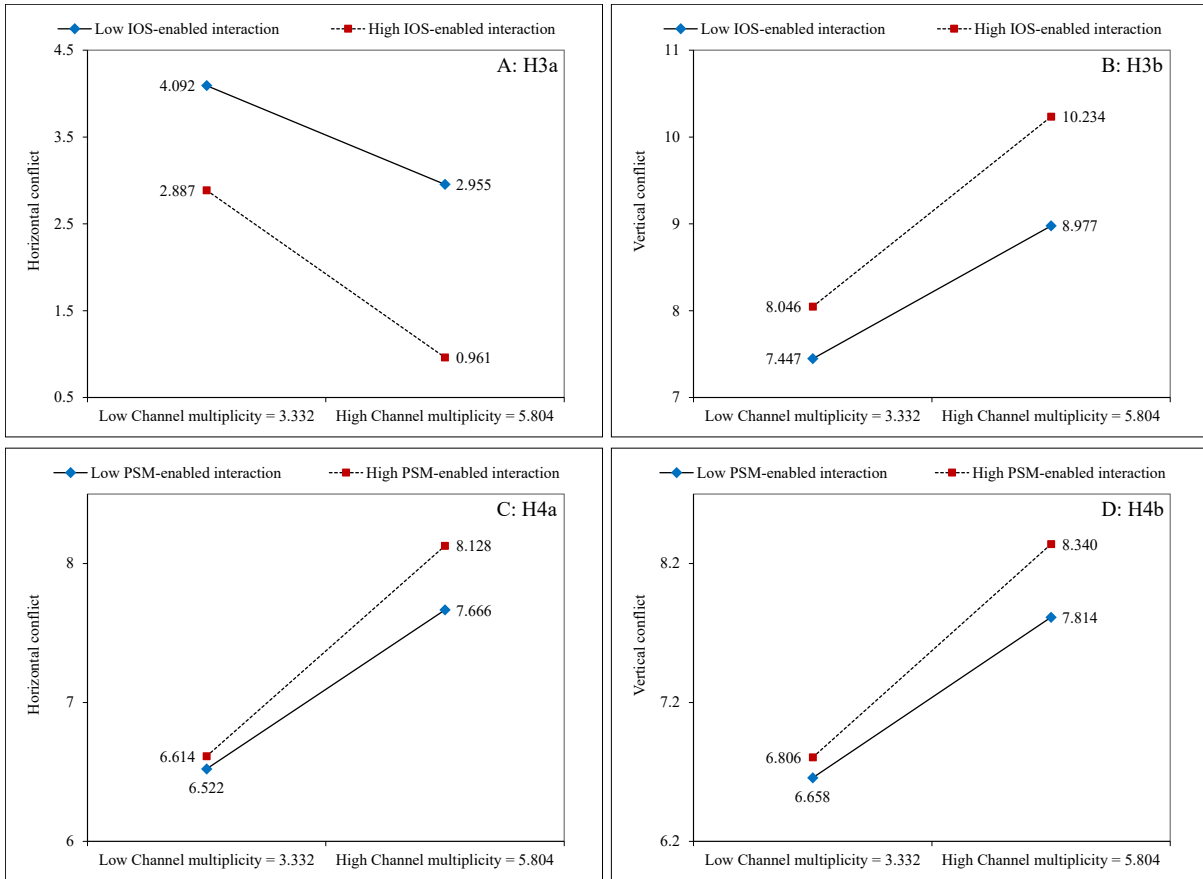
Dependent variables	Channel performance					
	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
<i>Direct effects</i>						
Horizontal conflict	0.080 <sup>†</sup> (0.026)	0.065 (0.026)			0.085 <sup>†</sup> (0.025)	0.091 <sup>†</sup> (0.026)
Vertical conflict	-0.105* (0.029)	-0.118* (0.029)			-0.102* (0.029)	-0.114* (0.030)
Channel multiplicity		0.126** (0.025)	0.114** (0.024)	0.107* (0.025)	0.115** (0.024)	0.110** (0.025)
IOS-enabled interactions			0.171*** (0.033)	0.170*** (0.035)	0.171*** (0.033)	0.162*** (0.035)
PSM-enabled interactions			0.071 (0.049)	0.073 (0.050)	0.069 (0.050)	0.069 (0.050)
<i>Moderating effects</i>						
Channel multiplicity × IOS-enabled interactions				0.016 (0.028)		0.043 (0.029)
Channel multiplicity × PSM-enabled interactions				0.039 (0.029)		0.042 (0.029)
<i>Control variables</i>						
Sales revenue	-0.060 (0.027)	-0.058 (0.027)	-0.043 (0.026)	-0.042 (0.026)	-0.048 (0.027)	-0.044 (0.027)
Relationship familiarity	0.025 (0.032)	0.018 (0.032)	0.033 (0.032)	0.028 (0.032)	0.035 (0.032)	0.029 (0.032)
Contractual governance	0.312*** (0.039)	0.302*** (0.039)	0.254*** (0.041)	0.252*** (0.041)	0.250*** (0.041)	0.248*** (0.041)
Relational governance	0.061 (0.041)	0.040 (0.041)	0.046 (0.041)	0.046 (0.041)	0.034 (0.042)	0.035 (0.042)
Coercive power	0.043 (0.040)	0.047 (0.039)	0.005 (0.040)	0.013 (0.041)	0.020 (0.040)	0.031 (0.041)
Joint problem solving	0.123** (0.046)	0.115* (0.046)	0.068 (0.046)	0.063 (0.047)	0.067 (0.046)	0.056 (0.047)
Food and beverage industry	0.001 (0.103)	-0.006 (0.102)	-0.012 (0.103)	-0.015 (0.103)	-0.012 (0.102)	-0.018 (0.103)
Machinery industry	0.000 (0.080)	-0.007 (0.079)	-0.007 (0.079)	-0.005 (0.080)	-0.007 (0.079)	-0.004 (0.079)
R <sup>2</sup>	0.176	0.191	0.207	0.208	0.216	0.218
Adjusted R <sup>2</sup>	0.160	0.173	0.190	0.188	0.195	0.195
Model F	10.870***	10.883***	12.044***	10.242***	10.699***	9.389***

Note: \*\*\*  $p < 0.001$  (two-tailed), \*\*  $p < 0.01$  (two-tailed), \*  $p < 0.05$  (two-tailed), <sup>†</sup>  $p < 0.05$  (one-tailed).

**Table 12.** Mediation effect bootstrap test

Paths	Effect	Boot SE	Boot LLCI	Boot ULCI
IOS-enabled interactions → horizontal conflict → performance	-0.0061	0.0054	-0.0221	0.0012
IOS-enabled interactions → vertical conflict → performance	0.0074	0.0053	0.0004	0.0224
IOS-enabled interactions → performance	0.1238	0.0332	0.0002	0.0585
SM-enabled interactions → horizontal conflict → performance	0.0748	0.0507	-0.0249	0.1744
SM-enabled interactions → vertical conflict → performance	-0.0122	0.0104	-0.0380	0.0039
SM-enabled interactions → performance	0.0184	0.0101	0.0032	0.0436

## Appendix. Decomposing the interaction effects



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