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## The influence of marketing exploitation and exploration on business-to-business small and medium-sized enterprises' pioneering orientation

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### ABSTRACT

Organisational learning theory proposes firms can gain market knowledge through adaptive processes - marketing exploitation and exploration. Our study examines how these processes impact pioneering orientation, firms' emphasis on launching innovative products ahead of competitors, in business-to-business (B2B) small- and medium-sized enterprises (SMEs). The prevailing view is firms should simultaneously pursue both processes or focus on just one. We challenge this notion and posit B2B SMEs should generally prioritise one process over the other to effectively shape pioneering orientation. However, certain circumstances like upstream supply chain (SC) integration and strong information technology (IT) competence enable firms to optimise benefits by alternating between processes. Our longitudinal analysis of 213 Chinese B2B SMEs supports this argument, revealing marketing exploration has a stronger positive influence on pioneering orientation than exploitation. Furthermore, our analysis shows upstream SC integration alone does not moderate, but combined with robust IT competence, can increase the advantages of marketing exploitation over exploration when fostering pioneering orientation in B2B SMEs.

### 1. Introduction

In today's intensely competitive business landscape, acquiring in-depth market knowledge<sup>1</sup> is paramount for firms' long-term success and growth. Organisational learning theorists (e.g., March, 1991; Vorhies, Orr, & Bush, 2011) posit that firms can gain and implement market knowledge by embracing "adaptive processes", encompassing two principal modes of engagement: exploitation and exploration. Marketing exploitation involves critically analysing firms' existing knowledge about the market (e.g. analysing the purchasing patterns) to refine their current strategies, while marketing exploration refers to firms actively seeking new market knowledge (e.g. conducting market research) that extends the existing knowledge and promote the development of new strategies (Kyriakopoulos & Moorman, 2004; Vorhies et al., 2011).

Recent research has highlighted the importance of adaptive processes like marketing exploitation and exploration for business-to-business (B2B) firms that are looking to attain and leverage their market knowledge (Mehrabani, Coviello, & Ranaweera, 2019; O'Cass, Heirati, & Ngo, 2014). By harnessing their market knowledge through these processes, B2B firms can craft effective strategies, engineer bespoke solutions, and cultivate robust client partnerships (Endres, Helm, & Dowling, 2020; Liu, Li, & Xue, 2010). Moreover, adaptive processes appear vital for the growth and survival of small- and medium-sized enterprises (SMEs) in general (e.g., Su, Cui, Samiee, & Zou, 2022; Voss & Voss, 2013). However, the specific implications of B2B SMEs' marketing exploitation and exploration remain unclear (see Table 1). It is vital to understand the implications of B2B SMEs engaging in processes like marketing exploitation and exploration, as these firms operate in a dynamic, resource-constrained environment that requires agility.

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<sup>1</sup> Different contexts may lead to varied interpretations of market knowledge (Vorhies et al., 2011; Zhou & Li, 2012). In this paper, "market knowledge" refers to firms' understanding of customer needs, available technologies, and competition (Vorhies et al., 2011).

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**Table 1**  
Notable empirical research on the impact of marketing exploitation and marketing exploration.

Authors	Adaptive Processes	Consequences	Boundary Conditions (Mediators & Moderators)	Context		Method	Summary of Findings
				Firm size	B2B/B2C		
Kyriakopoulos and Moorman (2004)	Ambidextrous effects on a single outcome	Financial Performance	Market orientation (moderator)	Unspecified	Unspecified	A time-lag survey of 96 Dutch business units	Market orientation enhances new product financial performance because it fosters synergy between marketing exploration and exploitation. Firms with a weak market orientation and high levels of both strategies experience a notable decline in new product financial performance. Exploitation capabilities lay the groundwork for cultivating exploration capabilities. While exploitation capabilities detrimentally affect product innovation, exploration capabilities positively influence product innovation and market performance.
Yalcinkaya et al. (2007)	Focus effects on single and different outcomes	Product innovation Market performance		Unspecified	B2C	A cross-sectional survey of 111 US importers (firms)	
Sarkees et al. (2010)	Ambidextrous effects on different outcomes	Revenue Profitability Customer satisfaction New products introduction	Functional implementation (mediator)	Unspecified	Unspecified	A cross-sectional survey of 135 US firms	Marketing strategy fully mediates the ambidextrous organization-performance relationship, impacting key performance dimensions like profits and customer satisfaction. Enhancements in ambidextrous organization benefits are realized with the incorporation of function implementation. Marketing exploration and exploitation enhance customer-focused marketing, with exploitation having a stronger impact. These capabilities also affect financial performance, but higher exploration levels can weaken the link between exploitation and customer-focused marketing.
Vorhies et al. (2011)	Focus and ambidextrous effects on a single outcome	Financial Performance	Customer focused marketing capabilities (mediator)	Unspecified	B2C	169 US firms were surveyed with objective measures of firm performance	Export market exploitation positively impacts performance, while exploration exhibits a negative linear link. Amid high market turbulence, exploration enhances outcomes. Balancing both exploitation and exploration improves export performance, particularly with higher exploitation levels.
Lisboa et al. (2013)	Focus, ambidextrous and nonlinear effects on a single outcome	Export performance	Export market turbulence (moderator)	Unspecified	Unspecified	A cross-sectional survey of 267 Portuguese export firms	Combining product exploration with market exploration or product exploitation with market exploitation yields complementary revenue effects. Market ambidexterity benefits larger firms but not smaller or older ones. It is crucial for driving long-term growth.
Voss and Voss (2013)	Focus and ambidextrous effects on a single outcome	Revenue performance	Firm size (moderator) Firm age (moderator)	SMEs	B2C	162 US firms were surveyed with objective measures of firm performance	Integrating exploratory product innovation with exploratory marketing and exploitative product innovation with exploitative marketing is vital for effective strategy implementation. Deploying each capability in isolation may not be as impactful as their combined integration.
O’Cass et al. (2014)	Focus effects on different outcomes	New product differentiation New product cost efficiency	Exploratory product innovation (moderator) Exploitation product innovation (moderator)	Unspecified	B2B	A cross-sectional study of 132 Iranian firms (senior – mid-level manager dyads)	

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Table 1 (continued)

Authors	Adaptive Processes	Consequences	Boundary Conditions (Mediators & Moderators)	Context		Method	Summary of Findings
				Firm size	B2B/B2C		
Sarkees et al. (2014)	Focus and ambidextrous effects on single and different outcomes, and comparisons between them	Cash flow Tobin's q	Firm size (moderator)	Unspecified	Unspecified	Panel data of 276 US firms between 1996 and, 2005	Superior marketing exploitation capabilities lead to higher operating cash flow but lower firm value. Conversely, superior marketing exploration capabilities result in higher firm value but lower operating cash flow. Firms excelling in both marketing capabilities enhance cash flow but not firm value. Simultaneously pursuing marketing exploitation and exploration harms firms' market performance, while supplier collaboration enhances the impact of marketing exploration but weakens the impact of marketing exploitation on market performance.
Ho and Lu (2015)	Focus and ambidextrous effects on a single outcome	Marketing performance	Collaboration with suppliers (moderator)	Unspecified	Unspecified	A cross-sectional survey of 220 Singapore firms	
Authors	Adaptive Processes	Consequences	Boundary Conditions (Mediators & Moderators)	Context		Method	Summary of Findings
				Firm size	B2B/B2C		
Zhang et al. (2015)	Relative and ambidextrous effects on single and different outcomes	New product financial performance	New product innovativeness (mediator) New product development speed (mediator) Customer need tacitness (moderator)	Unspecified	B2C	A cross-sectional survey of 225 PDMA members (representing their firms) in the US	Customer need tacitness enhances market exploration's impact on new product innovativeness and development speed. However, it weakens the effect of market exploitation on new product innovativeness and has no significant influence on new product development speed.
Josephson et al. (2016)	Focus effects on different outcomes	Firm risk Firm return		Unspecified	Unspecified	Panel data of 578 US firms (4258 observation) between 1999 and 2011	The movement towards exploitation in strategic marketing ambidexterity results in higher returns, yet it also entails a concurrent increase in firm-specific risk.
Mehrabi et al. (2019)	Relative and ambidextrous effects on a single outcome	Customer relationship performance		Unspecified	B2B & B2C	A cross-sectional survey of 141 US firms	Higher combined ambidexterity in customer management leads to improved performance. Customer management can be imbalanced without adverse effects on performance.
Adiwijaya et al. (2020)	Ambidextrous effects on a single outcome	Marketing performance		Unspecified	B2C	A cross-sectional survey of 99 Indonesian firms	Marketing ambidexterity has been demonstrated as a pivotal catalyst for enhancing marketing performance.
Ho et al. (2020)	Ambidextrous effects on a single outcome	Sales growth	Absorptive capacity (moderator)	Unspecified	Unspecified	318 Singapore firms were surveyed with objective measures of sales growth	The relationship between marketing ambidexterity and sales growth exhibits an upward, concave shape. Moreover, there is a positive association between marketing ambidexterity and sales growth for firms that possess relatively strong absorptive capacity. However, this relationship turns negative for firms characterized by weak absorptive capacity.
He et al. (2021)	Focus and ambidextrous effects on different outcomes	Innovation performance	Exploratory market-based innovation (moderator) Exploitative market-based innovation (moderator)	Unspecified	Unspecified	A cross-sectional survey of 237 Chinese firms	Ambidextrous marketing capabilities significantly enhance innovation performance, with market-based innovation playing a mediating role. Exploratory market-based innovation negatively moderates the relationship between exploitative market-based innovation and innovation performance.

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Organisational learning enables B2B SMEs to adjust their strategies based on their evolving market knowledge (Hansen, Idris, & Saridakis, 2023; Ranjan & Nayak, 2023). This ability is even more critical for B2B SMEs, given their need for agility when responding to the shifting markets. It is thus essential for B2B SMEs to embrace adaptive processes, in order to learn about the market effectively. The current research aims to address this limitation by improving our understanding of how B2B SMEs can leverage adaptive processes like marketing exploitation and exploration to achieve innovative leadership. (See Table 2.)

We challenge the prevailing assumption that the two most viable options when engaging in adaptive processes are to pursue marketing exploration and exploitation simultaneously or to focus exclusively on one to exclude the other. We posit that B2B SMEs should generally prioritise one adaptive process over the other to cultivate pioneering orientation, defined as introducing new products before their competitors (Mueller, Titus, Covin, & Slevin, 2012). However, in certain circumstances, such as high levels of upstream supply chain (SC) integration and information technology (IT) competence, B2B SMEs should recalibrate their priorities and embrace alternative adaptive

(Covin, Slevin, & Heeley, 2000). By positioning themselves as market pioneers, B2B SMEs can gain advantages<sup>3</sup> such as generating temporary monopoly profits and developing niches (Bouncken, Ratzmann, Tiberius, & Brem, 2020; Odlin & Benson-Rea, 2021). For example, Stripe introduced pioneering fintech products and services, fuelling its growth from a B2B SME into a large B2B firm (Konrad, 2022). Prioritising either marketing exploitation or exploration to exclude the other may offer advantages in cultivating a pioneering orientation, since its pursuit demands specific types of market knowledge input, which each adaptive process provides in different ways (Kyriakopoulos & Moorman, 2004). Moreover, selective engagement in marketing activities is strategically imperative, given B2B SMEs' limited resources (Eng & Spickett-Jones, 2009).

Furthermore, upstream SC integration refers to the extent to which firms align their operational activities, like planning and forecasting, with their upstream SC firms (Kim, Cavusgil, & Calantone, 2006; Wu, Yenyurt, Kim, & Cavusgil, 2006), while IT competence encompasses firms' proficiency concerning utilising IT (Levy, Loebecke, & Powell, 2003; Saraf, Langdon, & Gosain, 2007). Participating in these joint

Table 1 (continued)

Authors	Adaptive Processes	Consequences	Boundary Conditions (Mediators & Moderators)	Context		Method	Summary of Findings
				Firm size	B2B/B2C		
Li et al. (2022)	Focus effects on a single outcome	Entrepreneurial performance	Entrepreneurial orientation (moderator) Competitive intensity (moderator)	SMEs	Unspecified	A cross-sectional survey of 237 Chinese firms	Ambidextrous marketing capabilities (exploration and exploitation-oriented) enhance entrepreneurial performance. Entrepreneurial orientation weakens the exploitation-performance link but strengthens exploration-performance relationship. Competitive intensity has opposite effects on exploitation and exploration-performance links. Exploration boosts performance through enhanced adaptive marketing capabilities (AMCs), while ambidexterity reduces performance by diminishing AMCs. Yet, in a dissimilar host country, ambidexterity's negative impact on AMCs lessens due to easier information acquisition. Exploitation in similar or dissimilar host countries doesn't improve AMCs. Marketing exploration had a stronger positive impact on pioneering orientation than marketing exploitation in SMEs.
Su et al. (2022)	Focus and ambidextrous effects on a single outcome	Firm performance	Adaptive marketing capabilities (mediator) Home-host country similarity (moderator)	SMEs	Unspecified	A cross-sectional survey of 119 US firms	However, with SC integration and IT competence, marketing exploitation became more beneficial for pioneering orientation.
This Study	Relative effect on a single outcome	Pioneer orientation	SC interfirm integration (moderator) IT competence (moderator)	SMEs	B2B	A time-lag survey of 213 Chinese firms	Our Focus: Investigating how firms utilise marketing exploitation and exploration in the context of B2B SMEs to facilitate the introduction of new products/services ahead of competitors, while considering the roles of upstream SC integration and IT competence in this process.
		Our Focus: Investigation of how the relative effects of marketing exploitation and exploration affect pioneer orientation	Our Focus: Examining the role of upstream SC integration and IT competence as moderators				

processes.

More specifically, a pioneering orientation stems from an agile organisational culture focusing on sustained innovation leadership<sup>2</sup>

operational activities enables B2B SMEs to exchange valuable information and insights (Harland, Caldwell, Powell, & Zheng, 2007; Pramartari, 2007). Engaging in upstream SC integration can allow B2B SMEs to

<sup>2</sup> Though first-movers gain temporary advantages, long-term success is not guaranteed. Pioneers must aggressively innovate and lead to succeed. Complacency risks ceding dominance to determined rivals (Golder & Tellis, 1993).

<sup>3</sup> Pioneering has advantages but also drawbacks like free-riding, costs, legitimacy issues, and inertia (Boulding & Christen, 2001; Dobrev & Gotsoopoulos, 2010).

**Table 2**  
Descriptive statistics.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. High Technology	–													
2. Machinery and Equipment	–0.205*	–												
3. Electronic Goods	–0.105	–0.397*	–											
4. Consumer Goods	–0.069	–0.259*	–0.133	–										
5. Firm size	–0.220*	0.029	0.059	0.112	–									
6. Firm Age	–0.095	0.084	–0.004	0.015	0.367*	–								
7. Competitive Intensity	0.081	–0.028	–0.029	0.103	–0.048	–0.048	–							
8. Technology Turbulence	0.114	–0.013	–0.053	0.130	–0.056	0.003	0.390*	–						
9. Market Turbulence	0.095	–0.007	–0.044	0.139*	0.013	–0.030	0.338*	0.581*	–					
10. Marketing Exploitation	0.008	–0.048	–0.023	0.122	0.072	–0.132	0.208*	0.344*	0.309*	<b>0.742</b>				
11. Marketing Exploration	–0.020	0.028	–0.087	0.108	0.091	–0.061	0.189*	0.377*	0.386*	0.630*	<b>0.707</b>			
12. Upstream SC Integration	–0.092	0.077	–0.082	0.043	0.292*	–0.009	0.109	0.317*	0.244*	0.470*	0.442*	<b>0.789</b>		
13. IT Competence	0.070	–0.001	–0.064	0.038	0.219*	–0.008	0.118	0.287*	0.132	0.558*	0.490*	0.572*	<b>0.709</b>	
14. Pioneer Orientation	–0.045	0.147*	–0.128	0.137*	0.149*	0.021	0.128	0.239*	0.208*	0.318*	0.486*	0.404*	0.384*	<b>0.732</b>
Mean	0.050	0.440	0.170	0.080	2.250	1.210	4.860	5.010	4.870	5.610	5.260	5.340	5.497	4.886
Standard Deviation	0.222	0.497	0.376	0.272	0.441	0.217	1.016	0.919	1.064	0.878	0.941	0.874	0.867	1.135
Composite Reliability	–	–	–	–	–	–	–	–	–	0.831	0.746	0.891	0.917	0.766
Average Variance Extracted	–	–	–	–	–	–	–	–	–	0.551	0.500	0.622	0.502	0.536

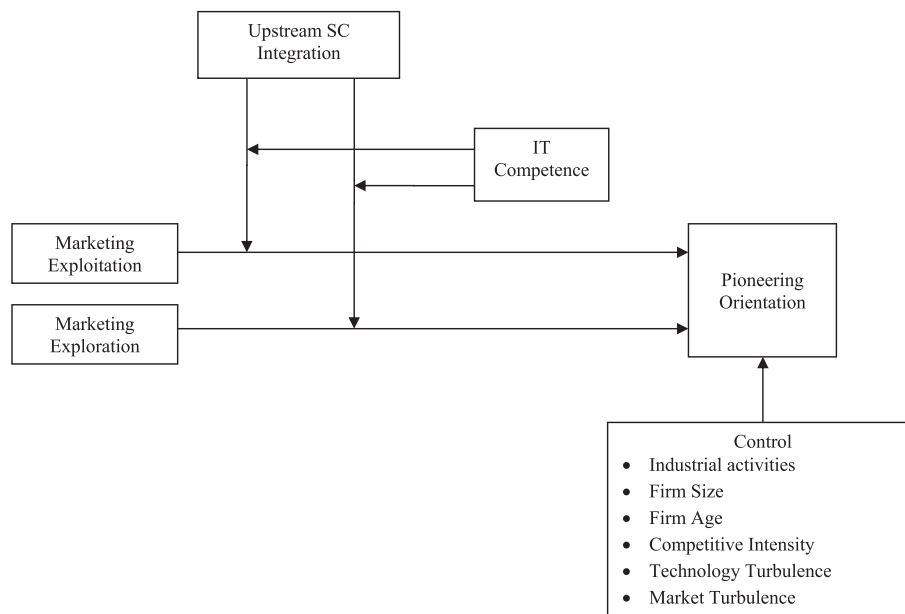
N = 213; \*p < 0.05.

Average variance Extracted (AVE) square roots are show in bold on the correlation matrix diagonal.

access new market knowledge from their upstream SC firms, yet may also disrupt their learning through adaptive marketing processes, thereby impacting the prioritisation of either marketing exploitation or exploration. In addition, the previous research highlights the crucial role of IT in facilitating B2B SMEs’ learning within SC networks (Michaelidou, Siamagka, & Christodoulides, 2011; Welker, van der Vaart, & van Donk, 2008). Therefore, a strong IT competence has the potential to enhance B2B SMEs’ learning through upstream SC integration, thus exerting further influence on their prioritisation of adaptive processes.

Drawing on insights from the organisational learning literature (March, 1991; Vorhies et al., 2011), this study constructs a conceptual framework that elucidates the relationships among marketing exploitation, marketing exploration, upstream SC integration, IT competence,

and firms’ pioneering orientation (Fig. 1). We test this framework empirically, using longitudinal survey data about 213 Chinese B2B SMEs in Zhejiang province. Our study aims to make three contributions. First, we elucidate novel insights on adaptive processes by examining their roles within the B2B SME context. The prior investigations in this domain have predominantly concentrated on either B2B (e.g., Mehrabi et al., 2019; O’Cass et al., 2014) or SME (e.g., Su et al., 2022; Voss & Voss, 2013) contexts, and rarely have researchers studied these contexts in conjunction. Second, we examine the relative impacts of marketing exploitation and exploration on firms’ pioneering orientation, thus furthering our understanding of how B2B SMEs selectively obtain and utilise knowledge through these adaptive processes, thus influencing their pursuit to become market pioneers. Third, by examining upstream



**Fig. 1.** Conceptual framework.

SC integration and IT competence as moderators, this study elucidates how B2B SMEs can obtain new market knowledge through upstream SC firms, with or without IT support, which may interfere with their learning via adaptive processes. Overall, our approach challenges the prevailing view by suggesting that B2B SMEs prioritising marketing exploitation or exploration is context-dependent. It also advances the applicability of organisational learning theory (March, 1991; Vorhies et al., 2011) by clarifying how resource-constrained SMEs strategically acquire and utilise their market knowledge to achieve a pioneering orientation in B2B settings.

## 2. Theory and hypotheses

### 2.1. Literature background

From a marketing perspective, organisational learning entails the comprehensive process of assimilating, preserving, and disseminating market knowledge, encompassing insights ranging from understanding the customers' needs to identifying emerging opportunities. Harnessing market knowledge empowers firms to refine their strategies and succeed competitively (Kyriakopoulos & Moorman, 2004; Vorhies et al., 2011). According to the organisational learning literature, firms can learn about the market through engaging in adaptive processes - marketing exploitation and exploration (March, 1991; Vorhies et al., 2011). The past empirical research covers many different situations (Table 1).

The perspectives on implementing adaptive processes fall into two camps. The focused perspective suggests that firms should pursue either exploitation or exploration, to the exclusion of the other, and investigate its impact either on a specific outcome, such as performance (Li, Ming, & Song, 2022), or on multiple outcomes, such as risk and return (Josephson, Johnson, & Mariadoss, 2016). The ambidextrous perspective posits that firms should pursue both exploitation and exploration simultaneously, investigating the ambidextrous effects on singular outcomes, such as financial performance (Kyriakopoulos & Moorman, 2004), or diverse outcomes, like revenue, profit, satisfaction, and new product launches (Sarkees, Hulland, & Prescott, 2010). Some researchers go further and analyse the focused and ambidextrous influences across both specific (e.g., Vorhies et al., 2011) and multiple outcomes (e.g., He, Pei, Lin, & Ye, 2021) in a single study, or delve more deeply to investigate the nonlinear effects (e.g., Lisboa, Skarmeas, & Lages, 2013) and compare the impact of focus versus ambidexterity (e.g., Sarkees, Hulland, & Chatterjee, 2014). Few studies have adopted a comparative perspective in order to examine the relative influence of marketing exploitation versus exploration (e.g., Mehrabi et al., 2019; Zhang, Wu, & Cui, 2015).

The existing studies on adaptive processes' consequences have two main focuses. The performance-related consequences are more popular and involve examining the impacts on metrics such as revenue (e.g., Voss & Voss, 2013), marketing outcomes (e.g., Adiwijaya, Wahyuni, Gayatri, & Mussry, 2020), customer relationship results (e.g., Mehrabi et al., 2019), sales growth (e.g., Ho, Osiyevskyy, Agarwal, & Reza, 2020), entrepreneurial outcomes (e.g., Li et al., 2022), and general performance (e.g., Su et al., 2022). Fewer studies concentrate on innovation-related outcomes, like product innovation (e.g., Yalcinkaya, Calantone, & Griffith, 2007), new product launches (e.g., Sarkees et al., 2010), new product differentiation and cost efficiency (O'Cass et al., 2014), and the overall innovation performance (e.g., He et al., 2021).

Researchers have examined the mediators and moderators to unravel the complex relationship between exploitation, exploration, and diverse outcomes (Table 1). The key variables fall into five categories, offering insights. The first is strategic resources and deployment, like firms' marketing orientation (Kyriakopoulos & Moorman, 2004), supplier collaboration (Ho & Lu, 2015), and adaptive marketing capabilities (Su et al., 2022). The second is innovation pursuit, like the interplay with innovation endeavours (He et al., 2021; Zhang et al., 2015). The third is managerial practices, including general management (e.g., Sarkees

et al., 2010), operations management (e.g., Ho & Lu, 2015), and marketing management (e.g., Zhang et al., 2015). The fourth is firm characteristics, like size (Voss and Voss (2013) or age (Sarkees et al. (2014)). The fifth are environmental factors, including export market turbulence (Lisboa et al., 2013), competitive intensity (Li et al., 2022), and country similarity (Su et al., 2022). Overall, the previous studies have clarified the boundary conditions that affect the influence of adaptive processes on various outcomes by explaining whether specific implementation strategies work under different conditions. However, they fail to recommend when firms should change their strategic pursuit of these adaptive processes.

To conclude, researchers have extensively analysed the effects of adaptive processes. However, most previous studies fail to differentiate between firm scale, encompassing large entities and SMEs, and the nature of firms' commercial operations (B2B or B2C) (Table 1). This results in a comprehensive yet non-granular overview that lacks nuance regarding implementation and the impacts contingent on a firm's specific context. A few exceptions exist, such as O'Cass et al. (2014) concerning B2B and Voss and Voss (2013), Li et al. (2022), and Su et al. (2022) concerning SMEs. However, none of the previous research investigates adaptive processes for B2B SMEs, where organisational learning is critical for agility to adjust the strategies based on the evolving market knowledge gained (Hansen et al., 2023; Ranjan & Nayak, 2023) and so respond quickly to the shifting markets and demands. Moreover, past studies have assumed that firms' pursuit of adaptive processes is permanent, leading to an optimal static choice of ambidexterity or a focus on either marketing exploitation or exploration, to the exclusion of the other, to achieve specific outcomes. We aim to address this omission and challenge this prevailing assumption by investigating how B2B SMEs prioritise marketing exploitation and exploration in order to acquire and apply their market knowledge and so achieve a new innovation-related outcome (a pioneering orientation under novel conditions – upstream SC integration and IT competence), as elements that have not been previously examined (Fig. 1). We suggest that B2B SMEs should generally prioritise marketing exploration over exploitation to shape their pioneering orientation. However, when upstream SC integration and high IT competence are present, switching from marketing exploration to exploitation becomes necessary to optimise the benefits. The following sections will elaborate on our arguments and hypotheses.

### 2.2. Adaptive processes and firms' pioneering orientation

Organisational learning enables firms to understand the market more effectively by using diverse methodologies, which allows them to adapt to the ever-changing conditions. Within the marketing discipline, organisational learning occurs through two fundamental adaptive processes – marketing exploitation and exploration – which enable firms to acquire and apply their market knowledge (Kyriakopoulos & Moorman, 2004; Vorhies et al., 2011). As noted previously, firms' marketing exploitation involves carefully reviewing their current market knowledge (e.g. analysing the purchasing patterns) in order to refine their existing marketing strategies, while marketing exploration means actively seeking out and integrating their new market knowledge (e.g. conducting market research) to extend their existing knowledge and so be in a better position to develop new marketing strategies. Drawing on the insights of organisational learning, we argue that implementing these adaptive procedures not only fosters innovation but also motivates B2B SMEs to position themselves as active market pioneers. At the same time, we do not expect marketing exploitation and exploration to produce equally strong effects and suggest that B2B SMEs will need to prioritise one adaptive process over the other to shape their pioneering orientation effectively.

More specifically, by thoroughly evaluating what they know about their business customers' needs, the available technology, and their competition, B2B SMEs gain important insights into what works well

and what does not in the market, as well as the needs and preferences of their business customers (Mehrabani et al., 2019; O’Cass et al., 2014). This in-depth understanding of the market enables B2B SMEs to identify strengths that they might leverage and weaknesses that they might address – factors that are conducive to generating new product concepts (Carlo, Lyytinen, & Rose, 2012). For example, B2B SMEs that sell software to other businesses can closely analyse the usage patterns to pinpoint specific features that the customers most value, alongside their competitors’ product offers. By re-examining such market knowledge, B2B SMEs can develop customised software offerings that they can tailor to suit these high-demand capabilities, thus enhancing their products compared to those of their competitors. Additionally, gaining a comprehensive awareness of their customer needs through engaging in marketing exploitation will enable B2B SMEs to navigate the complex process of launching new products more adeptly and mitigate the logistical and communication challenges they might face (Alvarado & Kotzab, 2001). By tapping into their current market knowledge, B2B SMEs can swiftly produce innovative offerings for their customers while minimising their risks regarding new product launches. This helps B2B SMEs to introduce pioneering products or services. Thus, we expect that marketing exploitation will positively influence B2B SMEs’ pioneering orientation.

On the other hand, by actively seeking out and acquiring new knowledge (e.g., by conducting market research) that exceeds the current understanding of their business customers’ needs, technology, and the competitive landscape, B2B SMEs can enhance their ability to identify gaps in their existing offerings and also predict future trends. This proactive learning facilitates the discovery of new product development opportunities (Calantone, Cavusgil, & Zhao, 2002; Wei, Yi, & Guo, 2014) and enables B2B SMEs to pioneer new offerings ahead of their rivals. For instance, SMEs that sell software to businesses can conduct further market research to uncover emerging trends, like cloud computing, which their customers may not yet know. Equipped with such new market knowledge, B2B SMEs can develop innovative, cloud-enabled software solutions before their competitors, thus positioning themselves at the forefront of the market. Moreover, firms that actively build new knowledge through exploration are more likely to experiment with novel concepts and dedicate resources to new product development (Liu, Ko, Ngugi, & Takeda, 2017; Love & Roper, 2015). By actively expanding their understanding beyond their current customers and their existing level of competitive awareness, B2B SMEs can gain the foresight and innovative edge they need to introduce novel offerings that will satisfy their customers’ latent needs ahead of their competitors. Thus, we expect that marketing exploration will positively impact B2B SMEs’ pioneering orientation.

While both marketing exploitation and exploration can influence B2B SMEs’ pioneering orientation, these impacts may differ. This is particularly relevant when considering the limitations of SMEs operating in a B2B context. Smaller firms’ limited market knowledge is a critical factor that may curb the pioneering insights firms may gain from marketing exploitation. Smaller businesses tend to possess less extensive market knowledge than larger firms (Gimenez-Fernandez, Sandulli, & Bogers, 2020). This is because they often focus on narrower consumer segments and compete with fewer rivals, thereby accruing less nuanced insights into their customers’ evolving needs and competitors’ strategies. A thorough analysis of these firms’ narrow existing market knowledge can still help them to refine their current offerings. However, B2B SMEs’ restricted insights may not expose them to the necessary transformative perspectives if they wish to devise disruptive new products that will reshape the markets. Moreover, firms that operate in the B2B markets tend to have a smaller, less diverse customer base than those operating in the B2C markets (Kotler & Keller, 2016). This distinct characteristic further constrains B2B SMEs’ propensity to amass a multifaceted market knowledge repository, which can serve as fertile ground for combining ideas that foster the development of unique design concepts, which form the basis for formulating pioneer products.

In contrast, implementing marketing exploration allows B2B SMEs to seek new market knowledge actively. It expands their limited market awareness, exposing them to trends, technology, and customers’ needs that may be unknown to their competitors. This external knowledge injection provides fresh perspectives for recognising gaps in the market and envisioning pioneering new offerings (Calantone et al., 2002; Zhou & Li, 2012). Furthermore, the continuous learning that becomes possible through marketing exploration is in line with an innovation ethos essential for pioneers. When B2B SMEs explore new domains instead of relying only on their current market knowledge, they can develop a pioneer mindset. This suggests that marketing exploration should have a greater impact on B2B SMEs’ pioneering orientation than marketing exploitation:

**Hypothesis 1.** Marketing exploration has a stronger positive effect on B2B SMEs’ pioneering orientation than marketing exploitation.

### 2.3. Upstream SC integration and IT competence

Firms can enhance their learning and acquire valuable market knowledge not only through their own adaptive processes but also by leveraging their SC networks (Ho & Lu, 2015; Klein, Bortolaso, & Minà, 2021). An essential mechanism for achieving this goal is SC integration, which encompasses both upstream and downstream firms or, in some cases both. To be more precise, the integration of SC firms through joint planning and forecasting activities aims to enhance the overall efficiency and effectiveness of SC operations (Kim et al., 2006; Wu et al., 2006). At its core, SC integration enables knowledge sharing, whereby firms share vital market knowledge, like sales forecasts and demand projections (Singh & Power, 2014; Stefansson, 2002). Effective knowledge sharing during SC integration requires trust and commitment from SC firms. When trust exists, SC firms are more willing to share their strategic information (i.e., their market knowledge) openly with their partners (Skippari, Laukkanen, & Salo, 2017). Likewise, SC firms committed to collaboration will invest in developing relationships and capabilities that enable proactive joint forecasting and planning (Skippari et al., 2017; Spekman & Carraway, 2006). Overall, higher levels of SC integration, from trust and commitment, allow firms to obtain market knowledge from their SC networks through joint forecasting and planning activities. By sharing their market knowledge, firms can align their strategies, optimise their inventories, and more accurately meet their customers’ demands. Leveraging collective market knowledge enables SC firms to make better-informed, synchronised decisions (Prajogo & Olhager, 2012). In this way, SC integration allows firms to tap into the broader market knowledge across their SC networks.

We apply these insights to the study’s context and specifically focus on the integration of firms involved in the upstream SC networks of B2B SMEs. More precisely, we argue that upstream SC integration moderates the effect of adaptive processes on B2B SMEs’ pioneering orientation. As noted, upstream SC integration refers to the alignment of firms’ operational activities, like planning and forecasting, with those of their upstream SC partners. Through upstream SC integration, B2B SMEs can access market knowledge from their upstream SC firms (Harland et al., 2007; Pramatar, 2007). For example, suppliers can share sales projections from their proprietary market research during joint forecasting and planning activities. This can yield crucial insights into the current market trends. SME manufacturers that actively participate in these joint activities can acquire and utilise this market knowledge to adjust their inventory levels and procurement schedules strategically, as well as develop new products to meet emerging market demands. Knowledge sharing of this type would benefit resource-constrained B2B SMEs by reducing their need to invest in other learning activities, such as independent market research. The combination of market knowledge gained from SC integration and generated from adaptive process engagement, respectively, allows B2B SMEs to build a more comprehensive knowledge repository. Analysing this broader set of knowledge empowers

SMEs to devise innovative product ideas and pioneer new offerings ahead of their competitors. Thus, B2B SMEs with a higher level of upstream SC integration can derive greater benefits from their adaptive processes, as these influence their pioneering orientation.

More specifically, implementing marketing exploitation offers B2B SMEs an opportunity to re-examine their current marketing knowledge, thus enriching their understanding of their customers and competitors (O’Cass et al., 2014; Su et al., 2022). Nevertheless, as noted previously, this benefit may be limited for B2B SMEs due to their constrained market knowledge repository. Extensive upstream SC integration helps to overcome this problem by providing access to unobtainable new market knowledge through market exploitation. However, the incremental benefit of marketing exploration on firms’ pioneering orientation may be less pronounced when the upstream SC integration levels are high. This is because implementing marketing exploration already allows firms to acquire new knowledge directly by conducting market research (Mehrabi et al., 2019; Vorhies et al., 2011). Meanwhile, high levels of upstream SC integration also allow B2B SMEs to acquire new market knowledge through knowledge sharing with their upstream SC firms during joint planning and forecasting activities. Some overlap may exist between the market knowledge gained from marketing exploration and that accessed via upstream SC integration. While B2B SMEs and their upstream SC firms conduct research from different vantage points, they often focus on understanding the same macro environment, customer segments, needs, and innovation opportunities within their industry. This shared focus can lead to convergence and overlap between some of the market knowledge acquired. In essence, both strategies produce windows into the same core market realities, so B2B SMEs may end up acquiring redundant or substantively similar market knowledge through engaging in marketing exploration and upstream SC integration because they fulfil connected roles within the same business ecosystem. Consequently, the beneficial influence of marketing exploration might be less pronounced than that of marketing exploitation on firms’ pioneering orientation, especially for B2B SMEs that exhibit elevated levels of upstream SC integration:

**Hypothesis 2.** Marketing exploitation has a stronger positive effect on firms’ pioneering orientation than marketing exploration in the context of B2B SMEs with a high level of upstream SC integration.

#### 2.4. IT competence

IT plays a pivotal role in facilitating organisational learning by allowing firms to acquire and process market knowledge gained from their SC networks (Cai, Huang, Liu, & Liang, 2016; Prajogo & Olhager, 2012). A critical enabler is efficient data collection from their SC partners, which provides insights into sales forecasts, demand projections, and other market trends (Vanpoucke, Vereecke, & Muyile, 2017). IT facilitates this by enabling automated data gathering, reducing the number of human errors, and improving accuracy (Dong & Yang, 2015). Advanced analytics, which IT also powers, are essential for extracting strategic insights from the collected data to inform decisions around new products, pricing, and customer targeting (Cai et al., 2016). However, the mere presence of IT alone is insufficient for meaningful learning. Firms also require strong IT competence to deploy these tools strategically (Levy et al., 2003; Saraf et al., 2007). By properly using IT for organisational learning, firms can leverage market knowledge within their SC networks.

As a result of these insights, we argue that when B2B SMEs have high levels of integrated SC upstream and strong IT competence, the impact of marketing exploitation on their pioneering orientation exceeds that of marketing exploration. More precisely, B2B SMEs with strong IT competence are better positioned to gain market knowledge from their upstream SC firms through adept IT use (Levy et al., 2003; Welker et al., 2008). The IT tools enable them to effectively capture extensive data from joint planning and forecasting activities with upstream SC firms

(Vanpoucke et al., 2017). B2B SMEs focusing on marketing exploitation are more likely to benefit from this, as they can integrate their internal market knowledge, derived from marketing exploitation, with their new market knowledge, acquired through IT-facilitated upstream SC integration, to build a broader knowledge repository. Consequently, B2B SMEs can develop new product concepts and launch novel products before their competitors by cultivating novel knowledge combinations. In contrast, although B2B SMEs that focus on marketing exploration can also utilise advanced IT to garner market knowledge from their upstream SC firms, this advantage is less substantial. There may be an overlap between the new market knowledge gained from their marketing exploration and participation in upstream SC integration, since both approaches concentrate on comprehending the core market realities (Prajogo & Olhager, 2012; Vanpoucke et al., 2017). While IT improves B2B SMEs’ effectiveness concerning acquiring and analysing new market knowledge from their SC partners, this knowledge still revolves around the same fundamental concepts. Hence, under high levels of upstream SC integration and IT competence, marketing exploitation enables B2B SMEs to leverage a pioneering orientation more fully by building a broader knowledge repository than would be possible with marketing exploration.

**Hypothesis 3.** Marketing exploitation has a stronger positive effect on firms’ pioneering orientation than marketing exploration in the context of B2B SMEs with high levels of upstream SC integration and IT competence.

### 3. Research method

#### 3.1. Questionnaire development and data collection

We surveyed Chinese B2B SMEs in Zhejiang’s industrial sector for several reasons. First, Zhejiang’s highly market-driven economy relies on firms reacting to customer demands using market knowledge (Zhao, Peng, Iqbal, & Wan, 2023). The private sector accounts for 66.3% of its GDP (Zhejiang Provincial Bureau of Statistics, 2021). Second, Zhejiang is innovative, with high R&D spending (Zhejiang Provincial Bureau of Statistics, 2021) and patent applications (Chinese Patent Office, 2020). Third, Zhejiang has advanced industrial clusters and firm integration (Zhejiang Online, 2020). Fourth, Zhejiang leads in IT-enabled digitalization, with over 405,000 cloud-connected SMEs, ranking first nationally (CAC, 2020). Fifth, Zhejiang’s SMEs accounted for 32.6% of China’s GDP in 2021 (Textor, 2022). China defines SMEs differently than other countries, varying by industry based on employee thresholds. Per the Ministry of Industry and Information Technology, Chinese industrial SMEs have under 1000 employees (MIIT, 2011).

We measured the multi-item constructs using a seven-point Likert-type scale. We adopted and modified existing scales to measure firms’ pioneering orientation (Mueller et al., 2012), marketing exploitation and exploration (Vorhies et al., 2011), upstream SC integration (Wu et al., 2006), and IT competence (Liu, Wei, Ke, Wei, & Hua, 2016). We controlled for industry, firm size, firm age, competitive intensity, technology turbulence, and market turbulence. Across different industries, firms’ pioneering strategy faces different challenges and demands (Mueller et al., 2012). We captured industry using dummy variables – technology, machinery and equipment, electronic goods, consumer goods, and others (as the benchmark group). Firm size (number of employees) and age (years since establishment) proxy resource reserves affect pioneering strategy (Liu et al., 2017; Mueller et al., 2012). Firm size and age were log-transformed (Hair, Black, Babin, & Anderson, 2010). We used competitive intensity, technology turbulence, and market turbulence to measure the environmental uncertainty influencing firms’ pioneering orientation (García-Villaverde, Elche, & Martínez-Perez, 2020). Existing scales were adopted and modified to measure these variables (Eng & Spickett-Jones, 2009; Lisboa et al., 2013; Mehrabi et al., 2019).



The English questionnaire was translated to Mandarin Chinese. Bilingual authors compared the English and Chinese versions. Pilot studies with two Chinese B2B SMEs provided feedback to refine the final questionnaire (see Appendix 1). An independent agency then collected data by targeting random samples of CEOs and executives across Zhejiang's industrial sectors. We targeted senior executives since they have more discretion over marketing, supply chain, IT, and product development in SMEs than in larger public firms (Nag, Neville, & Dimotakis, 2020). Of 1000 executives approached, 668 expressed interest. At Time 1, 668 executives received a questionnaire about marketing exploitation/exploration, upstream supply chain integration, IT competence, and controls, yielding 416 complete responses. Six months later, at Time 2, 416 executives received a questionnaire about pioneering orientation, yielding 213 matched, complete responses (31.89% response rate). The sample contained 144 small firms (<300 employees, 67.61%) and 69 medium firms (301–1000 employees, 32.39%), reflecting the coexistence of both. The average firm age was 17.70 years, reaching firms at various stages. No significant differences existed between early and late respondents.

### 3.2. Measurement reliability and validity

The confirmatory factor analysis (CFA) assessed the 4-factor hypothesized model. The results showed an adequate fit (Chi-square [ $X^2$ ] = 484.223; degree of freedom [ $df$ ] = 257;  $X^2/df$  = 1.884;  $p$ -value < 0.000; Comparative Fit Index [CFI] = 0.936; Root Mean Square Error of Approximation [RMSEA] = 0.065). The significant Chi-square may indicate misspecification, but we examined the residuals matrix and found that only one of the 338 covariances exceeded the 2.58 threshold for misfit (Byrne, 2016). Since the other fit indices were satisfactory, the CFA exhibited an adequate fit overall. Most items had standardized loadings above 0.700 (Appendix 1). We dropped the items with loadings below 0.500 (Hair et al., 2010). All constructs had an AVE above 0.500 (Table 1), indicating convergent validity (Hair et al., 2010). The composite reliability (CR) exceeded 0.700, demonstrating reliability (Hair et al., 2010). We assessed the discriminant validity by comparing the AVE square roots to the inter-construct correlations and using Chi-square difference tests between the constrained and unconstrained models ( $\Delta X^2 = 35.666$ ,  $p < 0.001$ ). Both results confirmed that the level of discriminant validity was adequate.

We anticipated that there would exist a high level of correlation (0.630) between marketing exploitation and exploration (Kyriakopoulos & Moorman, 2004; Vorhies et al., 2011). We assessed the potential impacts of this by conducting additional analyses. The variance inflation factor (VIF) was 1.560, below the 10 threshold, indicating that multicollinearity was not a serious problem (Hair et al., 2010). The discriminant validity was further confirmed using the method suggested by Bagozzi and Warshaw (1990). The correlation between marketing exploitation and exploration of <1.000 equals 0.370 (i.e.,  $1.000 - 0.630 = 0.370$ ), over double the standard error of 0.116 (i.e.,  $SE_{corr} = 0.058$ ;  $2 \times 0.058 = 0.116$ ). Therefore, discrimination validity was not an issue here.

To address the common method variance (CMV), we followed the recommendations of Podsakoff, MacKenzie, Lee, and Podsakoff (2003) regarding anonymity and confidentiality. In addition, we employed a two-wave survey design to mitigate CMV and the CFA marker technique (Williams, Hartman, & Cavazotte, 2010). We used relational embeddedness as a marker variable, which is the extent to which social attachments and interpersonal ties influence alliances (Lavie, Haunschild, & Khanna, 2012). Using the techniques of Williams et al. (2010), we developed and compared different models (i.e., CFA, Baseline, Method-C, Method-U, and Method-R). In our analyses, CMV did not threaten the validity of our hypotheses.

## 4. Data analysis

### 4.1. Model-free evidence

The first step in our formal analysis was to inspect the data visually. We plotted a bar chart to show the level of engagement with a pioneer orientation according to firm size (Fig. 2a). The chart indicates that medium-sized firms, which the Chinese government defines as those with 301–1000 employees (MIIT, 2011), had a higher pioneering orientation than small ones (those with up to 300 employees). This finding is consistent with previous studies, which found that smaller firms face greater challenges in pursuing innovation (Love & Roper, 2015). Second, the additional bar charts illustrate how specific factors influence SMEs' engagement with a pioneering orientation (Fig. 2b). Firms with higher levels of marketing exploitation, marketing exploration, upstream SC integration, and IT competence exhibit a greater pioneering orientation, regardless of their size. These relationships are in line with the prior research that linked these factors with innovation and new product development, albeit in different research contexts (e.g., Durmuşoğlu & Barczak, 2011; Wong, Wong, & Boon-Itt, 2013; Zhang et al., 2015). (See Fig. 3.)

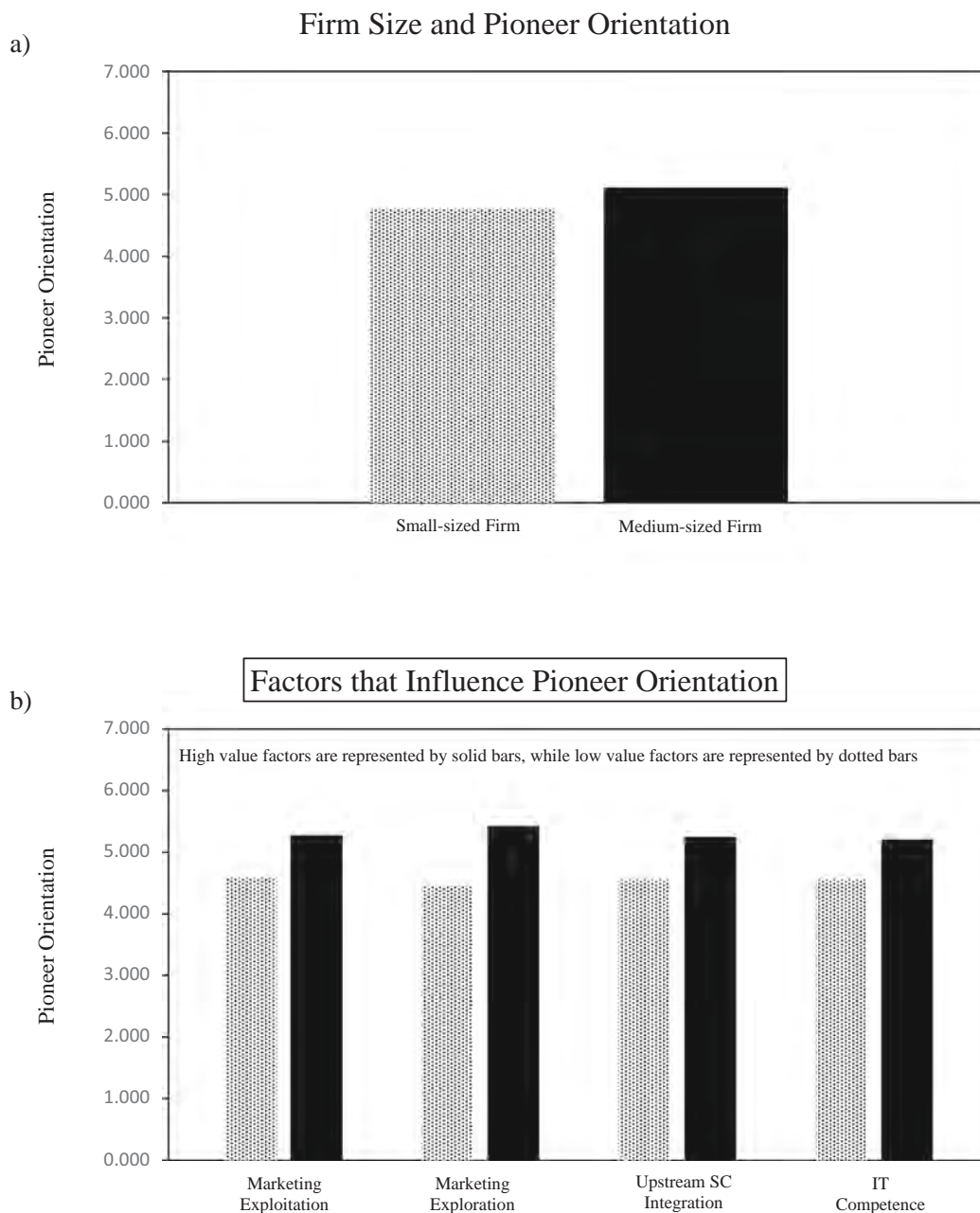
### 4.2. Main results

Table 3 presents four models to test the hypotheses. Model 1 includes only controls. Model 2 adds marketing exploitation and exploration to test Hypothesis 1 on their direct effects. Model 3 includes marketing exploitation, exploration, and upstream SC integration with two-way interactions to test Hypothesis 2 on moderating effects. Model 4 features marketing exploitation, exploration, upstream integration, and IT competence with two- and three-way interactions to test Hypothesis 3 on three-way moderation. This approach systematically tests the hypothesized direct and moderating relationships.

Hypothesis 1 proposes that marketing exploration has a more positive effect on B2B SME pioneering orientation than marketing exploitation. Results show that marketing exploration positively and significantly relates to pioneering orientation (Model 2:  $\beta = 0.520$ ,  $p < 0.001$ ), while marketing exploitation has no significant effect (Model 2:  $\beta = 0.020$ , n.s.). A  $t$ -test indicates the exploration coefficient is higher than the exploitation coefficient ( $t = 3.535$ ,  $p < 0.001$ ), confirming Hypothesis 1.

Hypothesis 2 posits that with strong upstream SC integration, marketing exploitation has a stronger positive relationship with pioneering orientation than marketing exploration. However, the interactions between marketing exploitation and upstream SC integration (Model 3:  $\beta = 0.003$ , n.s.) and between marketing exploration and upstream integration (Model 3:  $\beta = -0.011$ , n.s.) are insignificant. A  $t$ -test shows no significant difference between the coefficients ( $t = 0.096$ , n.s.), rejecting Hypothesis 2. Still, the overall trend aligns with the hypothesis that with high upstream SC integration, marketing exploitation has a more distinct beneficial influence on pioneering orientation than marketing exploration.

Hypothesis 3 posits that marketing exploitation has a greater influence on pioneering orientation than marketing exploration, especially with high upstream SC integration and IT competence. In Model 4, we focused solely on the three-way interaction, as lower-order terms become negligible with higher-order interactions (Hayes, 2022). Results show that the three-way interaction among marketing exploitation, upstream SC integration and IT competence positively and significantly affects pioneering orientation ( $\beta = 0.330$ ,  $p < 0.050$ ). In contrast, the interaction among marketing exploration, IT competence, and upstream SC integration has a negative significant effect ( $\beta = -0.331$ ,  $p < 0.050$ ). A  $t$ -test reveals a significant difference between the coefficients ( $t = 2.920$ ,  $p < 0.010$ ). Fig. 2 visually shows that marketing exploitation with high upstream SC integration and IT competence has the strongest positive effect on pioneering orientation (Fig. 2a) while marketing



**Fig. 2.** Model free evidence.

exploration with high upstream SC integration and IT competence has the most substantial negative effect (Fig. 2b). These results confirm our argument that marketing exploitation has a greater influence on pioneering orientation than marketing exploration, especially when combined with strong upstream integration and high IT competence. Thus, **Hypothesis 3** is supported.

#### 4.3. Post-hoc analysis

We conducted several additional analyses. First, endogeneity may be a concern because we did not generate our data by conducting a randomised experiment. Following the approach suggested by [Hamilton & Jackson, 2003](#), we applied a 3-stage hierarchical regressions approach to correct for any potential endogeneity. First, we regressed marketing exploitation and marketing exploration against upstream SC integration, IT competence, competitive intensity, technology turbulence, and market turbulence to obtain the residuals of the variable. These residuals

provided a cleaner measure of marketing exploitation and exploration, stripped of the effects of SC relationships ([Harland et al., 2007](#)), IT advancement ([Michaelidou et al., 2011](#)), and market uncertainty ([Hansen et al., 2023](#)), which may affect B2B SMEs' learning activities. We then used the residuals of marketing exploitation and exploration as the new independent variable. We repeated the regression analysis using these new variables (see [Table 4](#)). The new results matched our original results (Models 5–7). Thus, endogeneity was not a concern for our study.

Second, we conducted several robustness checks to promote the rigour of our analysis. As a starting point, we employed Cohen's  $f^2$  to assess the effect size by comparing the R-square changes between the models with and without main and interaction terms ([Selya, Rose, Dierker, Hedeker, & Mermelstein, 2012](#)). The effect sizes were 0.087 for marketing exploitation and 0.215 for marketing exploration, ranging from small (0.020) to large (0.350) but sufficient ([Aiken & West, 1991](#)).

We also examined the singular direct effect of our main variables on firms' pioneering orientation without interference from other variables

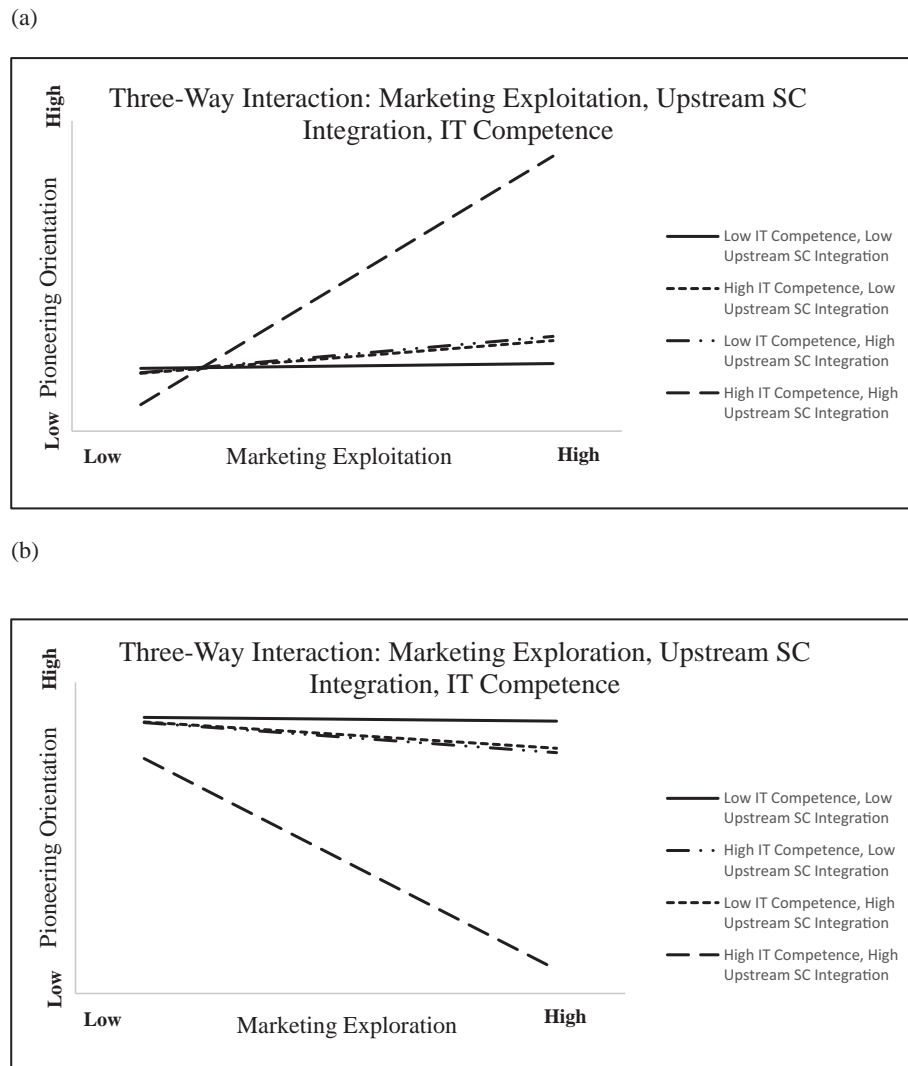


Fig. 3. Graphical representation.

(Table 5). We found that both marketing exploration (Model 8:  $\beta = 0.321$ ,  $p < 0.001$ ) and exploitation (Model 9:  $\beta = 0.531$ ,  $p < 0.001$ ) independently affected firms' pioneering orientation. Combined with our main findings, this suggests that marketing exploration has stronger effects while both adaptive processes affect firms' pioneering orientation. This further proves that B2B SMEs will prioritise marketing exploration to pursue a pioneering orientation over exploitation. In addition, upstream SC integration (Model 10:  $\beta = 0.438$ ,  $p < 0.001$ ) and IT competence (Model 11:  $\beta = 0.439$ ,  $p < 0.001$ ) also emerged as antecedents that enhance firms' pioneering orientation. This is unsurprising, as a core aspect of our theoretical argument is that upstream SC integration gives B2B SMEs access to new market knowledge from their upstream SC firms, which the B2B SMEs can then leverage to pursue pioneering strategies. Likewise, prior research by Ko and Liu (2019) showed that (both B2B and B2C) SMEs that were more adept at using IT tools were better able to engage in novel product innovation. (See Table 6.)

Furthermore, we examined the interaction effects of adaptive processes and IT competence on B2B SMEs' pioneering orientation. Our results show that the interactions involving both marketing exploitation and IT competence (Model 12:  $\beta = -0.076$ , n.s.), as well as marketing exploration and IT competence (Model 12:  $\beta = 0.055$ , n.s.), are not statistically significant concerning accounting for upstream SC integration. However, the effect of upstream SC integration on firms'

pioneering orientation remains positively significant (Model 12:  $\beta = 0.239$ ,  $p < 0.050$ ). This indicates that while B2B SMEs' proficient IT tool utilisation helps them process the market knowledge they obtain through their adaptive processes, it falls short of enabling a pioneering orientation. Additionally, we examined the interaction between adaptive processes and upstream SC integration on firms' pioneering orientation, this time concerning IT competence (Model 13). The results are consistent with our main findings that interactions involving marketing exploitation and upstream SC integration and marketing exploration and upstream SC integration are not statistically significant. Together, this reinforces our assertion that B2B SMEs' adept IT tool use plays a pivotal role in helping them acquire and process the market knowledge they obtain from their upstream SC firms via upstream SC integration. The B2B SMEs' pioneering orientation is enhanced by amalgamating their market knowledge acquired through adaptive processes and IT-facilitated upstream SC integration.

Finally, we conducted analyses of the ambidextrous strategy. Many studies explore the ambidextrous effects of exploitation and exploration (Table 1), and recognise their interrelation (O'Reilly & Tushman, 2013). We examined the ambidextrous strategy by creating a variable of the product of exploitation and exploration, per Voss and Voss (2013) and Vorhies et al. (2011). This ambidextrous strategy had an insignificant effect on firms' pioneering orientation (Model 14:  $\beta = -0.007$ , n.s.). We also employed the approach of Gibson and Birkinshaw (2004), and

**Table 3**  
Main results.

	Model 1	Model 2	Model 3	Model 4
Covariates:	Coeff (t-value)	Coeff (t-value)	Coeff (t-value)	Coeff (t-value)
High Technology	-0.051 (-0.140)	0.083 (0.247)	0.160 (0.483)	0.006 (0.019)
Machinery and Equipment	0.370 (2.008)*	0.371 (2.204)*	0.357 (2.153)*	0.323 (1.931)†
Electronic Goods	-0.133 (-0.572)	-0.033 (-0.157)	0.018 (0.088)	0.017 (0.081)
Consumer Goods	0.499 (1.625)	0.471 (1.679)†	0.536 (1.937)*	0.509 (1.824)†
Firm Size	0.381 (2.038)*	0.227 (1.314)	0.067 (0.380)	-0.083 (-0.436)
Firm Age	-0.234 (-0.634)	0.023 (0.067)	0.110 (0.322)	0.139 (0.408)
Competitive Intensity	0.039 (0.479)	0.027 (0.370)	0.035 (0.484)	0.045 (0.596)
Technology Turbulence	0.219 (2.108)*	0.084 (0.863)	0.028 (0.291)	0.004 (0.038)
Market Turbulence	0.080 (0.912)	-0.030 (-0.365)	-0.027 (-0.335)	-0.028 (-0.323)
<b>Main Effects:</b>				
Marketing Exploitation		0.020 (0.197)	-0.049 (-0.082)	-0.291 (-2.153)*
Marketing Exploration		0.520 (5.322)***	0.530 (1.045)	0.604 (4.747)***
Upstream SC Integration			0.367 (0.767)	0.261 (2.311)*
IT Competence				0.184 (1.605)
<b>Interaction Terms</b>				
Marketing Exploitation x Upstream SC Integration			0.003 (0.027)	0.006 (0.033)
Marketing Exploration x Upstream SC Integration			-0.011 (-0.108)	0.049 (0.374)
Marketing Exploitation x IT Competence				-0.029 (-0.165)
Marketing Exploration x IT Competence				0.001 (0.007)
Upstream SC Activity Integration x IT Competence				-0.062 (-0.456)
Marketing Exploitation x Upstream SC Integration x IT Competence				0.330 (2.014)*
Marketing Exploration x Upstream SC Integration x IT Competence				-0.331 (-2.122)*
Constant	2.466 (3.473)**	0.891 (1.216)	0.124 (0.047)	4.627 (6.487)***
<b>Model Statistics</b>				
F-Value	3.299	7.104	6.470	5.009
P-Value	0.001	0.000	0.000	0.000
R-Square	0.128	0.280	0.314	0.343

\*\*\* p < 0.001; \*\* p < 0.010; \* p < 0.050; † p < 0.100.  
Dependent variable: Pioneering Orientation.

divided the sample into exploitation-focused, exploration-focused, and ambidextrous firms. The pioneering orientation's means were 4.737, 5.173, and 5.046, respectively. This suggests that an ambidextrous strategy may not be optimal for resource-constrained SMEs. The ANOVA found differences between the groups (F = 3.143, p < 0.050) and also between exploitation- and exploration-focused firms (F = 5.819, p < 0.050).

The prior research notes that implementing both strategies requires substantial resources (O'Reilly & Tushman, 2013; Tushman & O'Reilly, 1996). With limited resources, B2B SMEs may struggle to support concurrent activities, which explains the minimal impact of the

**Table 4**  
Endogeneity.

	Model 5	Model 6	Model 7
Covariates:	Coeff (t-value)	Coeff (t-value)	Coeff (t-value)
High Technology	0.126 (0.356)	0.226 (0.664)	0.001 (0.001)
Machinery and Equipment	0.362 (2.060)*	0.345 (2.038)*	0.360 (2.174)*
Electronic Goods	-0.068 (-0.306)	0.012 (0.055)	0.063 (0.306)
Consumer Goods	0.477 (1.631)	0.554 (1.960)†	0.568 (2.065)*
Firm Size	0.384 (2.318)*	0.095 (0.522)	-0.065 (-0.371)
Firm Age	-0.192 (-0.538)	0.051 (0.148)	0.116 (0.342)
Competitive Intensity	0.034 (0.440)	0.040 (0.537)	0.058 (0.785)
Technology Turbulence	0.218 (2.205)*	0.100 (1.001)	0.024 (0.245)
Market Turbulence	0.079 (0.940)	0.057 (0.704)	0.049 (0.607)
<b>Main Effects:</b>			
Marketing Exploitation <sub>Residual</sub>	-0.087 (-0.753)	0.074 (-0.103)	-0.353 (-2.607)*
Marketing Exploration <sub>Residual</sub>	0.462 (4.422)***	0.567 (1.070)	0.606 (4.784)***
Upstream SC Integration		0.405 (4.449)***	0.342 (3.274)**
IT Competence			0.254 (2.414)*
<b>Interaction Terms</b>			
Marketing Exploration <sub>Residual</sub> x Upstream SC Integration		-0.013 (-0.092)	0.089 (0.511)
Marketing Exploration <sub>Residual</sub> x Upstream SC Integration		-0.026 (-0.256)	0.037 (0.275)
Marketing Exploitation <sub>Residual</sub> x IT Competence			-0.102 (-0.570)
Marketing Exploration <sub>Residual</sub> x IT Competence			-0.075 (-0.491)
Upstream SC Integration x IT Competence			-0.035 (-0.365)
Marketing Exploitation <sub>Residual</sub> x Upstream SC Integration x IT Competence			0.443 (2.467)*
Marketing Exploration <sub>Residual</sub> x Upstream SC Integration x IT Competence			-0.301 (-1.996)*
Constant	2.418 (3.629)***	1.270 (1.817)†	4.028 (5.853)***
<b>Model Statistics</b>			
F-Value	4.961	5.641	5.322
P-Value	0.000	0.000	0.000
R-Square	0.214	0.285	0.357

\*\*\* p < 0.001; \*\* p < 0.010; \* p < 0.050; † p < 0.100.

Dependent variable: Pioneering Orientation.

Marketing Exploitation<sub>Residual</sub> = Marketing Exploitation - Marketing Exploitation<sub>Predicted</sub>.

Marketing Exploration<sub>Residual</sub> = Marketing Exploration - Marketing Exploration<sub>Predicted</sub>.

ambidextrous strategy. This supports our argument that B2B SMEs should be selective when engaging in marketing exploitation and exploration.

Furthermore, Models 15 and 16 analysed the two- and three-way interactions concerning the ambidextrous strategy. The two-way interaction between an ambidextrous strategy and upstream SC integration was insignificant for firms' pioneering orientation (Model 15: β = -0.035, n.s.). The three-way interaction between an ambidextrous strategy, upstream SC integration, and IT competence was also insignificant (Model 16: β = -0.053, n.s.). It became apparent that implementing the ambidextrous strategy did not have any evident influence on firms' pioneering orientation in either scenario (the two- and three-

**Table 5**  
Robustness checks.

	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Covariates:	Coeff (t-value)	Coeff (t-value)	Coeff (t-value)	Coeff (t-value)	Coeff (t-value)	Coeff (t-value)
High Technology	−0.007 (−0.021)	0.083(0.247)	0.095(0.271)	−0.182 (−0.523)	0.057(0.171)	0.070(0.210)
Machinery and Equipment	0.391(2.183)*	0.370(2.203)*	0.359(2.049)*	0.384(2.200)*	0.362(2.195)*	0.360(2.181)*
Electronic Goods	−0.115 (−0.510)	−0.032 (−0.153)	−0.038 (−0.170)	−0.062 (−0.281)	0.024(0.113)	0.026(0.123)
Consumer Goods	0.459(1.537)	0.473(1.691)†	0.577(1.977)*	0.549(1.889)†	0.545(1.975)*	0.554(2.011)*
Firm Size	0.301(1.640)	0.229(1.331)	0.096(0.513)	0.136(0.741)	0.025(0.137)	0.029(0.164)
Firm Age	−0.012 (−0.033)	0.014(0.042)	0.002(0.007)	−0.054 (−0.154)	0.093(0.276)	0.100(0.296)
Competitive Intensity	0.021(0.263)	0.028(0.385)	0.042(0.541)	0.029(0.374)	0.039(0.532)	0.035(0.480)
Technology Turbulence	0.143(1.387)	0.086(0.892)	0.089(0.871)	0.080(0.789)	0.012(0.125)	0.010(0.102)
Market Turbulence	0.044(0.513)	−0.030 (−0.365)	0.054(0.646)	0.109(1.308)	−0.011 (−0.128)	0.001(0.009)
Main Effects:						
Marketing Exploitation	0.321(3.536) ***				0.282(0.425)	−0.149 (−0.250)
Marketing Exploration		0.531(6.534) ***			0.150(0.230)	0.540(1.068)
Upstream SC Integration			0.438(4.785) ***		0.239(2.347)*	0.293(0.612)
IT Competence				0.439(4.968) ***	0.322(0.685)	0.182(1.692)†
Interaction Terms						
Marketing Exploitation x Upstream SC Integration						0.006(0.052)
Marketing Exploration x Upstream SC Integration						−0.018 (−0.186)
Marketing Exploitation x IT Competence					−0.076 (−0.616)	
Marketing Exploration x IT Competence					0.055(0.466)	
Upstream SC Integration x IT Competence						
Marketing Exploitation x Upstream SC Integration x IT Competence						
Marketing Exploration x Upstream SC Integration x IT Competence						
Constant	1.204(1.549)	0.939(1.366)	1.215(1.680)†	0.971(1.318)	−0.341 (−0.133)	0.033(0.013)
Model Statistics						
F-Value	4.388	7.847	5.579	5.784	6.319	6.286
P-Value	0.000	0.000	0.000	0.000	0.000	0.000
R-Square	0.178	0.280	0.216	0.223	0.325	0.324

\*\*\* p < 0.001; \*\* p < 0.010; \* p < 0.050; † p < 0.100.

Dependent variable: Pioneering Orientation.

way interactions). The remaining effects remained consistent with Table 3, thus bolstering the robustness of our original findings.

## 5. Discussion

### 5.1. Theoretical implications

Our study makes several noteworthy contributions. First and foremost, it provides novel insights into the effects of marketing exploration and exploitation on B2B SMEs' strategies. The existing research focuses either on B2B marketing itself (e.g., Mehrabi et al., 2019; O'Cass et al., 2014) or SME contexts in isolation (e.g., Su et al., 2022; Voss & Voss, 2013), while paying little attention to their interconnection. This research examines how B2B SMEs apply marketing exploration and exploitation strategies to pursue their pioneering orientation. We also investigated the boundary conditions that surround this process. Additionally, this research advances the applicability of the organisational learning concept (March, 1991; Vorhies et al., 2011), since it demonstrates that, by implementing marketing exploitation and exploration under different conditions, SMEs may be able to take advantage of a variety of learning opportunities that might help them to attain their goal of increasing their competitiveness through their pioneering orientation.

Second, this study contributes to the adaptive processes literature by

challenging the assumption that B2B SMEs should always balance their marketing exploration and exploitation (e.g., Kyriakopoulos & Moorman, 2004) or solely focus on one strategy to the exclusion of the other (e.g., Li et al., 2022), in all situations. Our examination of their relative impacts on firms' pioneering orientation provides a more nuanced perspective: neither ambidexterity nor a singular focus is universally optimal. Specifically, we found that marketing exploration exhibits a stronger positive effect on firms' pioneering orientation than exploitation. This suggests that, for B2B SMEs that pursue pioneering advantages, prioritising marketing exploration over leveraging on their existing knowledge places them in a better position to introduce new products ahead of their competitors. In addition, our focus on firms' pioneering orientation as an outcome variable also advances this literature, which primarily examines the impact of marketing exploitation and exploration on performance-related consequences (e.g., Josephson et al., 2016; Lisboa et al., 2013) rather than innovation-related outcomes (e.g., He et al., 2021; Yalcinkaya et al., 2007). Firms' pioneering orientation, which means their attempts to establish innovation leadership through new product introduction (Mueller et al., 2012), has suffered from a lack of research on how adaptive processes influence it. This study enhances our understanding of how marketing exploitation and exploration differentially shape this specific innovation outcome. Furthermore, we advance the applicability of the organisational learning theory (March, 1991; Wei et al., 2014) to explain why B2B

**Table 6**  
Ambidextrous strategy analysis.

	Model 14	Model 15	Model 16
Covariates:	Coeff (t-value)	Coeff (t-value)	Coeff (t-value)
High Technology	0.084 (0.250)	0.155 (0.464)	−0.004 (−0.012)
Machinery and Equipment	0.373 (2.197)*	0.359 (2.136)*	0.321 (1.893)†
Electronic Goods	−0.033 (−0.153)	0.021 (0.097)	0.014 (0.067)
Consumer Goods	0.473 (1.678)†	0.542 (1.943)†	0.524 (1.848)†
Firm Size	0.226 (1.304)	0.048 (0.264)	−0.096 (−0.495)
Firm Age	0.022 (0.063)	0.107 (0.311)	0.126 (0.367)
Competitive Intensity	0.027 (0.365)	0.034 (0.457)	0.044 (0.579)
Technology Turbulence	0.084 (0.861)	0.029 (0.293)	−0.005 (−0.045)
Market Turbulence	−0.030 (−0.368)	−0.029 (−0.359)	−0.031 (−0.354)
Main Effects:			
Marketing Exploitation	0.020 (0.193)	−0.067 (−0.622)	−0.299 (−2.153)*
Marketing Exploration	0.520 (5.298)***	0.487 (4.676)***	0.625 (4.730)***
Ambidextrous Strategy	−0.007 (−0.100)	−0.022 (−0.279)	−0.039 (−0.386)
Upstream SC Integration		0.306 (3.079)**	0.249 (2.059)*
IT Competence			0.177 (1.479)
Interaction Terms			
Marketing Exploitation x Upstream SC Integration		0.014 (0.119)	−0.038 (−0.207)
Marketing Exploration x Upstream SC Integration		0.001 (0.011)	0.050 (0.374)
Ambidextrous Strategy x Upstream SC Integration		−0.035 (−0.467)	−0.015 (−0.123)
Marketing Exploitation x IT Competence			−0.004 (−0.022)
Marketing Exploration x IT Competence			−0.019 (−0.111)
Ambidextrous Strategy x IT Competence			−0.020 (−0.161)
Upstream SC Integration x IT Competence			−0.070 (−0.492)
Marketing Exploitation x Upstream SC Integration x IT Competence			0.382 (2.090)*
Marketing Exploration x Upstream SC Integration x IT Competence			−0.337 (−1.866)†
Ambidextrous Strategy x Upstream SC Integration x IT Competence			0.053 (0.500)
Constant	2.536 (3.518)**	4.277 (6.030)***	4.739 (6.398)***
Model Statistics			
F-Value	6.481	5.631	4.122
P-Value	0.001	0.000	0.000
R-Square	0.280	0.315	0.345

\*\*\* p &lt; 0.001; \*\* p &lt; 0.010; \* p &lt; 0.050; † p &lt; 0.100.

Dependent variable: Pioneering Orientation.

SMEs benefit less from marketing exploitation than exploration when pursuing a pioneering orientation. We suggest that B2B SMEs with less existing knowledge will reap fewer benefits from leveraging their existing knowledge and, therefore, marketing exploration will enable SMEs to acquire new knowledge and achieve greater benefits in pursuit of innovation leadership.

Third, we contribute to the adaptive processes literature by challenging the assumptions regarding the impacts of marketing exploitation

and exploration. In particular circumstances, such as the presence of high levels of upstream SC integration and IT competence, B2B SMEs should optimise the benefits by switching between these adaptive processes. Building upon the framework of organisational learning (March, 1991), we argue that upstream SC integration reflects B2B SMEs' learning from their upstream SC firms, which may complement the benefits of marketing exploitation by bringing new market knowledge to the firms. At the same time, upstream SC integration may substitute for some of the benefits derived from implementing marketing exploration, as there could exist an overlap in the market knowledge gained. Together, these can impact the relative effects of marketing exploitation and exploration on firms' pioneering orientation. However, our findings do not support this claim. Although the regression coefficients from our analysis align with our initial argument regarding signs and directions, the outcomes failed to reach statistical significance. A plausible rationale for this outcome is that firms' processing of market knowledge from their upstream SC firms via upstream SC integration demands considerable resources. (Dong & Yang, 2015; Stefansson, 2002). Given the potential limitations regarding their availability, this need for significant resources could prove challenging for B2B SMEs (Wu et al., 2006).

This explanation further supports our subsequent hypothesis, which suggests that B2B SMEs' IT competence can strengthen the moderating effect of upstream SC integration, thus adding more weight to this rationale. By leveraging IT tools, firms can acquire and process their market knowledge more effectively and at a lower cost (Eng, 2004; Wu et al., 2006). Therefore, B2B SMEs' proficiency in IT tools can enhance their ability to acquire and process new market knowledge from their upstream SC firms via upstream SC integration. Therefore, under high levels of upstream SC integration and IT competence, B2B SMEs can benefit from engaging in marketing exploitation rather than exploration when pursuing a pioneering orientation. This is because such IT proficiency helps B2B SMEs overcome the challenge posed by their limited human resources for processing this knowledge. Our research also reveals an interesting finding that contradicts the assumption that marketing exploration benefits innovation-related outcomes in all cases (O'Cass et al., 2014; Yalcinkaya et al., 2007). We discovered that when B2B SMEs simultaneously adopt marketing exploration and upstream SC integration coupled with IT competence, the effect of marketing exploration on their pioneering orientation becomes negative. This may be because a greater overlap of market knowledge exists than we initially thought. As we have argued, the new market knowledge that B2B SMEs acquire by engaging in marketing exploration and upstream SC integration provides insights into the same core market realities. With the support of IT tools, B2B SMEs can improve their ability to acquire and process the market knowledge they obtain from their upstream SC firms, which now may offer them almost identical insights as conducting independent market research. This means that both organisational learning strategies can substitute for each other. The benefits to B2B SMEs of engaging in marketing exploration may be reduced when high levels of upstream SC integration and IT competence exist. Thus, our findings reveal important boundary conditions regarding the effectiveness of marketing exploration by B2B SMEs.

Collectively, we contribute to the broader discourse on organisational learning in B2B SMEs through their SC networks (Harland et al., 2007; Pramatar, 2007) and underscore the pivotal role of IT in facilitating such learning (Michaelidou et al., 2011; Welker et al., 2008). We suggest that B2B SMEs can derive greater benefits from learning from their upstream SC firms through upstream SC integration only when they exhibit high levels of IT competence and shift their emphasis from marketing exploration to exploitation. By synthesising the findings from our additional analysis of B2B SMEs that employ ambidextrous strategies, we further advance the perspective of Gupta, Smith, and Shalley (2006) concerning firms' decision-making processes related to the pursuit of organisational ambidexterity. They assert that adopting an ambidextrous strategy yields substantial benefits. However, certain circumstances might prompt firms to focus solely on either exploitation

or exploration strategies and find this more advantageous. Collaboration between two firms is one such scenario, enabling one firm to pursue an exploitation strategy exclusively while at the same time leveraging the innovative ideas generated by the other firm, that is engaged in exploration (Gupta et al., 2006). Our study contributes to this understanding by expanding the collaboration scope from a bilateral setting to encompass multiple firms within upstream SC networks. Within this structure, a B2B SME, along with its upstream SC counterparts, need not necessarily specialise in divergent strategies. Provided that B2B SMEs obtain adequate market knowledge from their upstream SC networks, they can effectively focus on engaging in marketing exploitation in order to promote their pioneering orientation. Nevertheless, in the context of B2B SMEs with limited resources, it is imperative for them to use IT tools effectively to support the acquisition and processing of market knowledge from their upstream SC firms in order to attain these benefits. This highlights the contingent value of network-based organisational learning and ambidextrous strategies, based on B2B SMEs' IT competence.

### 5.2. Managerial implications

The critical managerial implication from our study for B2B SME managers seeking to enhance pioneering orientation is that marketing exploration and exploitation strategies should be adapted based on firms' SC integration and IT competence levels. Usually, managers should prioritise marketing exploration by researching new markets, segments and approaches. This exploration pathway generally exerts a stronger positive influence on pioneering new products than re-examining existing knowledge about the market (marketing exploitation). However, the priorities shift when B2B SMEs achieve high levels of upstream SC integration and IT competence. The advantages of marketing exploitation are further pronounced when extensive upstream SC connections facilitate the acquisition of new market knowledge alongside the requisite IT competence to support this operation. Specifically, we recommend that managers embrace marketing exploitation when their firms exhibit strong upstream SC integration and IT competence. The ability to efficiently leverage marketing knowledge from upstream SC firms transforms marketing exploitation into the optimal route for pioneering orientation. Without high levels of upstream SC integration and IT competence, marketing exploration remains the priority.

In summary, managers should differentiate strategies based on the SME's circumstances. Assessing upstream SC integration and IT competence indicates when the focus should switch to marketing exploitation for maximum payoff. This tailored alignment of marketing initiatives with SC relationships and IT assets can optimise pioneering orientation. Managers should pursue marketing exploration in most cases but be ready to prioritise marketing exploitation when positioned to capitalise on inter-firm knowledge flows and IT-enabled learning. Thoroughly evaluating these contingencies empowers managers to make informed decisions regarding the transition from marketing exploration to exploitation, which is crucial for pioneering initiatives.

### 5.3. Limitations and future research directions

The first limitation is the single data source. Future research could use multiple sources, such as executives for skill questions, upstream partners for SC operations, and downstream customers for innovation outcomes. This would mitigate single-source bias. Second, executive self-reports could introduce bias. Future studies could correlate subjective measures with objective data (e.g. linking pioneering orientation scales to performance indicators like new product launches). Third, the assumption that SMEs have limited resources may not always hold (Dimitropoulos, Koronios, Thrassou, & Vrontis, 2020; Moreno & Casillas, 2007). Firm size and age may not universally proxy resources. While we controlled for these based on prior research (Liu et al., 2017; Mueller

et al., 2012), future research should better differentiate resource-rich and resource-poor SMEs.

Fourth, this study focused on industrial B2B SMEs in China's Zhejiang Province, potentially limiting generalizability. For instance, China's SME definitions vary by industry (MIIT, 2011), as do international definitions (OECD, S, 2005). Future research could study B2B SMEs across industries in China and other countries to improve generalizability. Researchers could also test the framework's validity for non-B2B SMEs (i.e., B2C or larger firms) to determine if the findings apply only to B2B SMEs or are more generalisable. Further research should confirm whether the conclusions apply outside the specific context studied here. Fifth, our study may suffer from selection bias, as firms that pioneer without exploring may fail quickly (Jaeger, Zacharias, & Brettel, 2016). Examining surviving and non-surviving firms might help clarify how adaptive processes impact firms' pioneering orientation.

Sixth, "market knowledge" is critical in developing our argument, but we did not directly test for its presence. Future research could incorporate variables reflecting market knowledge acquisition and processing to understand better how adaptive processes, upstream SC integration, and IT competence impact B2B SMEs' pioneering orientation. Finally, we examined upstream SC integration and IT competence as boundary conditions associated with marketing exploitation. Our results suggesting marketing exploitation is more beneficial could be misleading since the framework lacks boundary conditions related to marketing exploration, like R&D integration and search capability. Future research could explore these within the same framework to clarify the impacts of adaptive processes on pioneering orientation.

### Appendix 1. Measurement.

Measurements	Loading
Questionnaires completed in Time 1	
<b>IT Competence</b>	
We have established corporate rules and standards for hardware and operating systems to ensure platform compatibility.	0.691
We have identified and standardized data to be shared across systems and business units.	0.659
The manner in which the components of our information systems are organized and integrated allows for rapid changes.	0.690
Our information systems are designed to support new business relationships easily.	0.704
Our information systems are designed to rapidly accommodate changes in business requirements.	0.639
We can implement information technology in many business processes	0.735
We can implement information technology in a large number of functional areas.	0.753
The extent to which information technology is used in our business processes (e.g., operation, management, and decision making) is high	0.738
In our firms, top managers are interested in using information technology applications in the firm.	0.744
In our firms, top managers consider information technology applications as important to the firm.	0.716
In our firms, top managers commit to support information technology applications in the firm.	0.714
<b>SC Interfirm Integration</b>	
My company develops strategic plans in collaboration with our supply chain partners.	0.719
My company collaborates actively in forecasting and planning with our supply chain partners.	0.733
My company projects and plans future demand collaboratively with our supply chain partners.	0.842
Collaboration in demand forecasting and planning with our supply chain partners is something we always do in my company.	0.839
My company always forecasts and plans activities collaboratively with our supply chain partners.	0.801
<b>Marketing Exploitation</b>	
We consistently re-examine information from previous projects and/or studies to modify existing marketing processes.	0.771
We routinely adapt existing ideas when developing new marketing processes.	0.724
We regularly reassess previous project data to incrementally and routinely improve our existing marketing procedures.	0.732

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(continued)

Measurements	Loading
We routinely adapt existing ideas to develop new marketing processes with a focus on improving efficiency.	0.742
<b>Marketing Exploration</b>	
We continually develop new marketing procedures that are very different from others developed in the past.	0.670
We routinely introducing new marketing procedures which are daring, risky, or bold.	–
We consistently using new market knowledge to develop new marketing processes which deliver different outputs from existing processes.	0.785
We use new marketing knowledge to create new marketing processes not used before.	0.650
Questionnaires completed in Time 2	
<b>Pioneering Orientation</b>	
We offer products that are very similar to those of our major competitors (reverse coded).	–
We offer products that are unique and Focus different from those of our major competitors.	0.623
We compete heavily on the basis of being first-to market with new products.	0.681
We typically precede our major competitors in bringing new products to market.	0.833

– Items deleted due to low factor loading.

## Data availability

The data that has been used is confidential.

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