

Business model innovation and export performance

Web Appendix

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Web Appendix 1 Review of the pertinent literature

Table WA1 Empirical contributions on outcomes of Business Model Design (BMD) and Business Model Innovation (BMI)

Source	Conceptualization	Domestic/ international	Context/sample	Mediators	Moderators	Outcome variables	Theory	Key findings
Zott & Amit (2007)	Novelty-centered business model design (BMD) Efficiency-centered BMD	Domestic	Survey of 190 cross-industry entrepreneurial firms from US and Europe	-	-	Firm performance	Configuration theory Resource-dependence view	Novelty-centered BMD is positively associated with firm performance.
Zott & Amit (2008)	Novelty-centered BMD	Domestic	Survey of 170 cross-industry firms with online business model (BM)	-	-	Firm performance	Contingency theory	Novelty-centered BMD coupled with marketing strategies that focus on cost leadership, differentiation, or early market entry is positively associated with firm performance.
Brettel, Strese,& Flatten (2012)	Novelty-centered BMD Efficiency-centered BMD	Domestic	Survey of 234 SMEs from German-speaking countries of technology-intensive industries	-	Organizational life-cycle stage Organizational life stage Relationship-specific investments	Firm performance	Relational perspective	Novelty- and efficiency-centered BMD are positively associated with firm performance. The outcome of efficiency-centered BMD is moderated by organizational life cycle.
Cucculelli & Bettinelli (2015)	BMI and BM change	Domestic	Survey of 376 Italian SMEs from the clothing industry	-	Intangible assets	Firm performance	Organizational learning perspective	BMI change is positively associated with firm performance. Intangibles positively moderate this link. BMI change and intangibles have positive/complementary effects on performance.
Kim & Min (2015)	New BMI addition	Domestic	Panel data of 56 physical store-based retailers with online retailing addition	-	-	Firm performance	RBV	Adding a new BMI to the existing one is positively associated with the incumbent performance.
Velu (2015)	Degree of BMI	Domestic	Survey of 129 new ventures with electronic trading platforms in the US	-	Third-party alliance partners	New venture's survival	Contingency theory	There is a U-shaped relationship between the degree of BMI and the survival of the new firms. Partnership with third-party firms with complementary assets reduces the survival of the new firms as the degree of BMI increases.
Guo, Tang, Su, & Katz (2017)	BMI	Domestic	Survey of 155 Chinese SMEs; industry not specified	-	-	SME performance	Discovery perspective	BMI is positively associated with the SME performance.
Wei, Song, & Wang (2017)	Novelty-centered BMD Efficiency-centered BMD	Domestic	Survey of 186 Chinese manufacturing firms	-	-	Firm performance	Business ecosystem theory	Novelty-centered BMD is positively associated with firm performance.
Clauss, Kesting, & Naskrent (2018)	Customers' perceived BM innovativeness in terms of value creation, proposition, and capture	Domestic	Survey of 435 restaurant customers in Germany	Customer value co-creation behavior	-	Customer satisfaction	Signaling theory	Perceived value creation innovativeness and value proposition innovativeness are positively associated with customer satisfaction and customer value co-creation behavior. Customer value co-creation behavior mediates the perceived BM innovativeness–customer satisfaction link.
Futterer, Schmidt, & Heidenreich (2018)	Newness in the BM's four core elements.	Domestic	Survey of 128 German firms across various industries	-	-	Internal corporate venturing performance	-	Newness in BM is positively associated with ICV performance.
Pati, Nandakumar, Ghobadian, Ireland, & O' Regan (2018)	Novelty-centered BMD Efficiency-centered BMD	Domestic	Survey of 241 Indian SMEs across various industries	-	Environmental dynamism Environmental munificence Firm age	Firm performance	Contingency theory	Novelty-centered BMD is positively and efficiency-centered BMD is negatively associated with firm performance. Dynamism moderates the outcomes of novelty-centered BMD. Dynamism, munificence, and age moderate the outcomes of efficiency-centered BMD.

Chen, Liu, & Chen (2020)	Novelty-centered BMD Efficiency-centered BMD	Domestic	Survey of 183 Chinese firms across various industries	-	-	Firm performance	Organizational learning theory	Novelty- and efficiency-centered BMD are positively associated with firm performance.
Cucculelli & Peruzzi (2020)	BMI change in terms of vertical integration, intangibles, and complexity	Domestic	Panel data of 67,241 Italian manufacturing SMEs	-	-	Post-crisis firm survival	Organizational learning	Vertical integration, intangibles, and complexity positively and negatively influence post-crisis firm survival depending on their level.
Guo, Wang, Su, & Wang (2020)	BMD and strategic orientation	Domestic	Survey of 281 Chinese digital start-ups	-	Technological openness User interactivity	Firm performance	RBV Demand-side perspective	BMD strategic orientation (technology and customer) is positively associated with performance in start-ups. Technological openness and user interactivity positively moderate this association.
Bhatti, Santoro, Khan, & Rizzato (2021)	BMI	Domestic	Survey of 172 IT firms from Pakistan	-	-	Firm performance	Social cognition theory	BMI is positively associated with firm performance.
Hennart, Majocchi, & Hagen (2021)	Global niche BMD Mass-market BMD	International	Survey of 222 Italian SMEs across various industries	-	-	Speed of internationalization	Internationalization theory	Firms pursuing global niche BMD internationalize faster than those with a mass-market BMD.
Latifi, Nikou, & Bouwman (2021)	BMI in terms of value capturing, delivery, and creation	Domestic	Survey of 563 cross-industry European SMEs	Efficiency growth Revenue growth Organizational capabilities	-	Firm performance	-	The relationship between BMI and firm performance is fully mediated by efficiency growth, revenue growth, and organizational capabilities.
Liu, Liu, & Gu (2021)	Novelty-centered BMD Efficiency-centered BMD	Domestic	Survey of 131 Chinese manufacturing firms across various industries	External integration Internal integration	-	Operational performance	Dynamic capability theory	Novelty-centered BMD is positively associated with external and internal integration. External integration fully mediates the relationship between novelty-centered BMD and operational performance. Efficiency-centered BMD has a direct effect on operational performance.
Pati, Ghobadian, Nandakumar, Hitt, & O'Regan (2021)	Novelty-centered BMD	Domestic	Survey of 238 Indian SMEs across various industries	-	-	Firm performance	-	Novelty-centered BMD is positively associated with firm performance.
Wang & Habibulla (2021)	BMI and business model conflict	Domestic	Survey of 133 Chinese firms from the retail sector	-	-	Incumbent performance	Cognitive perspective Organizational learning	Business model conflict mediates the relationship between resource deployment and incumbent performance.
Jin, Liu, Liu, Gu, & Shao (2022)	Novelty-centered BMD Efficiency-centered BMD	Domestic	Survey of 282 Chinese high-tech firms	Radical product innovation capability Incremental product innovation capability	Technological turbulence	- Innovation Performance	Dynamic capability theory	Novelty-centered BMD is positively associated with innovation performance and that this relationship is partially mediated by radical and incremental product innovation capability. Efficiency-centered BMD is indirectly associated with innovation performance through incremental product innovation capability. Technological turbulence strengthens the effectiveness of novelty-centered BMD whereas it reduces the effectiveness of the efficiency-centered BMD.
Li, Xue, Li, & Ivanov (2022)	Novelty-centered BMD Efficiency-centered BMD	Domestic	Survey of 262 Chinese firms from various industries	Supply chain robustness Supply chain agility	-	Firm performance	RBV Dynamic capability theory	Efficiency and novelty-centered BMD are both positively associated with supply chain agility, whereas only efficiency-centered BMD is positively associated with supply chain robustness. Efficiency-centered BMD is positively associated with firm performance. Novelty-centered BMD is not directly associated with firm performance. Robustness and agility mediate the efficiency-related performance outcomes, but no mediation was evident for novelty-related performance outcomes.

Menter, Göcke, & Zeeb (2022)	Radical BMI Incremental BMI	Domestic	Longitudinal survey of 69 German firms across various industries	-	-	Person-organization fit	Configuration theory	Incremental BMI is positively associated with person-organization fit whereas radical BMI is negatively linked with person-organization fit.
Leppänen, George, & Alexy (2023)	Novelty-centered BMD Efficiency-centered BMD	Domestic	Longitudinal survey of 125 and 169 US and European internet-enabled firms	-	Competitive intensity Firm size Technological environment	Firm performance	Configuration theory	Novelty-centered BMD is insufficient for high firm performance unless it combines with efficiency-centered BMD and a differentiation strategy; Effects are contingent on the intensity of competition, firm size, and firms' technological environment.
This study	Novelty-centered BMI Efficiency-centered BMI	International	Survey of multiple key informants from 263 unique firms from various industries in the UK engaged in exporting activities	Differentiation advantage Cost advantage	Relational embeddedness Scope of international experience Duration of international experience Competitive intensity	Export performance	Organizational learning theory Resource-based view Sources–positions–performance framework	Novelty-centered BMI is positively associated with export performance through differentiation advantage. Efficiency-centered BMI is associated with export performance through cost advantage. The scope of international experience and competitive intensity negatively moderate the differentiation advantage outcomes of novelty-centered BMI. Relational embeddedness and duration of international experience positively moderate the outcome of efficiency-centered BMI. Competitive intensity positively moderates the differentiation advantages-export performance link and negatively moderates the cost advantages-export performance link.

Notes: SME = small and medium-sized enterprises.

Web Appendix 2 Field interviews

To enhance our knowledge on the topic, explore the study's pragmatic relevance, and deepen our understanding of BMI in the exporting context, we conducted 11 in-depth semi-structured interviews with top managers (see Table SI3.1). These managers came from different sectors and were familiar with the firm's core business model. The recorded interviews were transcribed and on average, they had a duration of 43 minutes. The interview questions mainly focused on determining the relevance of BMI for firms' positional advantage, identifying potential contingency effects, and finding detailed examples of novelty- and efficiency-centered BMI in the exporting context. Analysis of the interview material showed the relevance of the two BMI dimensions. Overall, the field interviews supported our conceptualization of BMI and its importance for the success of exporting operations (see Table SI3.2).

Table WA2.1 Interview participants

Firm	Job role/ position in firm	Industry	Industry specifically	Years of exporting (approx.)	Firm size	Main destination markets
A	Executive director	Information	Computer software	20	Large	27 offices around the globe
B	Sales director	Information	Software development	20	Large	US, Europe, Middle East, and Australia
C	Regional business director	Manufacturing	Electrical & electronic manufacturing	21	Large	Scandinavia, India, North America, and South America
D	Director of channel operations	Manufacturing	Beverage manufacturing	50	Large	Europe, Australia, and US
E	CEO	Manufacturing	Semiconductor manufacturing	40	Medium	China, Japan, Korea, US, and Europe
F	Executive director	Manufacturing	Industrial machinery manufacturing	20	Medium	Europe, Far East, and US
G	Sales manager	Manufacturing	Textile manufacturing	50	Large	Vietnam, China, Korea, and North Africa
H	E-commerce regional manager - Eastern Europe	Retailing	Internet/ retailing	40	Medium	Poland, Hong Kong, and US
I	Asia-Pacific finance business partner	Retailing	Retail	12	Large	US, Australia, France, Spain, Germany, and Italy
J	Sales excellence manager	Services	Marketing services	15	Large	Six continents
K	Group head of IT operations	Wholesaler	Document solutions and IT industry	100	Large	US, Europe, Austria, Asia, New Zealand, and Middle East

Notes: Small = 10–49, medium = 50–249, large = 250 or more people (source: OECD - <https://data.oecd.org/>).

Table WA2.2 Field interview quotes

Examples and outcomes	Quotes from field interviews	Interview partner
Example of novelty-centered BMI	“We do have our flagship store model in key cities. We invest lots of money in those stores. In addition to what we have in our regular stores, we have all big screens, digital displays, many things for the customers to interact with in the stores, which very few competitors, particularly in the Asian markets, are able to do.”	Asia-Pacific finance business partner, retail sector
Outcome of novelty-centered BMI	“The flagship stores are using a quite innovative business model and they have helped us to stand out from the crowd.”	Asia-Pacific finance business partner, retail sector
Example of efficiency-centered BMI	“In the US market, about 2 years ago, we started using the so called catalogue distributors for our products, and that enabled us to become a lot more efficient in dealing with the US market because the catalogue distributors are keeping stocks of the products and dealing with many customers who are buying smaller quantities.”	CEO, semiconductor sector
Outcome of efficiency-centered BMI	“[The efficiency-centered BMI] reduces the burden on our own people and our own administration staff for dealing with lots and lots of smaller customers. We just deal with one catalogue distributor and he in turn deals with lots of smaller customers. Which helped us gaining cost advantages otherwise we needed to spend more money on more staff to deal with extra workload. It also made the process simpler for customers ... most of the customers have trading accounts with the catalogue distributors, so they don't have to go through the process of opening an account with us.”	CEO, semiconductor sector
Contingency effect of relational embeddedness	“We recently opened in the Indonesia and the partner we have there has many ventures outside sport retails like technology and mobile network shops. They have big bank of customers' data that we are able to carefully get exposure to. They are big companies, so they have access to suppliers that we would not necessary have if we have went in there on our own. So, partnering with that venture in this process helped us to maximize and leverage the benefits of our market entry.”	Asia-Pacific finance business partner, retail sector
	“In the US, we ask local networks to take us around and introduce us to obvious potential purchasers.”	Group head of IT operations, IT sector
	“So, we don't do anything directly in the Middle East. You wouldn't sell in the in the Middle East without going through a local partner. You know, you've got to have people on the ground, people who know what's going on there. And so that brings another level of due diligence with us and making sure that we put on both the right partners that we've got the right governance in place as well. The terms and conditions are so onerous in the Middle East, we just wouldn't agree to them, so you have to be able to find a partner that would agree to the end users terms and conditions and then we can agree different terms with the partner. So yeah, in the Middle East, it's all through partners.”	Sales director, software development sector
Contingency effect of international experience	“It [success of BMI] all depends to knowledge of the market, knowledge of your skills, and gaps within your skills and the ability to fill those as it sensible within the country you are trying to sell to.”	Group head of IT operations, IT sector

Web Appendix 3 Comparison of BMI and innovation themes

Novelty- and efficiency-centered BMI are in some ways similar to exploratory and exploitative innovation (see Table SI2). For example, successful novelty-centered BMI and exploratory innovation need exploration of new knowledge that exists outside firm and industry boundaries, while successful efficiency-centered BMI and exploitative innovation require exploitation of knowledge that is new to a firm but not necessarily to an industry. Yet, despite some similarities, distinct differences exist between BMI and innovation themes particularly in terms of their unit of analysis (i.e., the entire activity system vs. a product, process, or technology).

Table WA3 Comparison of BMI and innovation themes

Differentiation Criterion	Novelty-centered BMI	Efficiency-centered BMI	Exploratory innovation	Exploitative innovation
Definition	Novel ways of performing economic exchanges among business partners (Zott & Amit, 2007)	Courses of actions taken by a firm to decrease transaction cost and risk (Zott & Amit, 2007)	Radical innovations to meet emerging market needs (Jansen, Bosch, & Volberda, 2006)	Incremental innovations to meet the existing market needs (Jansen et al., 2006)
Unit of analysis	Entire activity system (Zott & Amit, 2010)	Entire activity system (Zott & Amit, 2010)	Product, process, or technology	Product, process, or technology
Exploration/exploitation orientation	Exploration and design of novel business models that are new to a firm and to an industry (Amit & Zott, 2015)	Exploitation and improvement of business models that might be new to a firm but not to an industry (Amit & Zott, 2015)	Exploration and design of novel products, processes, or technologies that are new to a firm and to an industry	Exploitation and improvement of existing products, processes, or technologies that might be new to a firm but not to an industry
Search orientation	Exploration of new knowledge and skills that exist outside firm and industry boundaries	Exploitation of knowledge and skills that exist within firm or industry boundaries	Exploration of new knowledge and skills that exist outside firm boundaries	Exploitation of knowledge and skills that exist within firm boundaries
Knowledge requirements	General business knowledge	General business knowledge	Technical knowledge	Technical knowledge
Market examples	ALD Vacuum Technologies launched the “Own & Operate” business model, which allowed ALD to offer a new combination of products, services, and information.	Dow Corning, the global producer of silicone, came up with a new cost-oriented business model in which competitive prices were offered to bulk buyers through automation, excess capacity minimization, and usage of low-cost sale channels.	Tesla developed Model S, which was unique in terms of the technology used (i.e., electric, battery range) but also luxurious, high-tech, fast, and safe.	Toyota’s Prius combined existing technologies (i.e., gasoline and electric motor technology) to improve fuel efficiency.
Exporting examples	A car manufacturer/exporter came up with new commercial networks (e.g., new suppliers, distributors, customers) to market and support new electric cars using the concept of swappable batteries in collaboration with local garages for quick swap of a flat battery for a fully charged one in around three minutes.	A manufacturer/exporter developed a new and innovative ordering and warehousing system that enables automatic, user-friendly, and transparent calculation of quantities and costs required for ordering and shipping purposes (e.g., container size vs. quantity ordered).	A polymer manufacturer/exporter developed a technology to manufacture sustainable and soundproof bio-polymers based on by-products derived from agriculture.	A water filter manufacturer/exporter came up with a new five-stage water filtration system for home use based on its existing patented technology.

Web Appendix 4 Key informants and sample information

Prior to sending the questionnaire, we approached each company to (1) verify the contact details of the key people on file and update the list accordingly with appropriate key informants, (2) present information about our study and explain its importance for exporting firms, and (3) encourage informants to participate in the study. We then emailed the survey link to managers who were knowledgeable, able, and willing to participate in the study. Reminder messages were sent to non-respondents two and four weeks after the initial contact.

To ensure key informant competence, we employed 7-point scales (1 = *very low*, 7 = *very high*) and asked respondents to indicate their (1) level of knowledge of the firm's activities, (2) level of knowledge of the firm's export activities, and (3) confidence in answering the questions raised. We dropped any informant scoring lower than 4 on a 7-point scale on any of the three items from the analysis. The mean composite informant competence rating was 5.73 ($n = 263$). On average, respondents had been with their firms for six years and in their current position for four years. To further verify informant quality, we conducted multiple tests. First, we compared the secondary objective data collected from the COMPUSTAT database with the information received from our key informants. A strong correlation was revealed ($r > 0.80$, $p = 0.000$) between the two sets of figures, indicating high reliability of responses. Second, our analysis shows that the answers provided by multiple respondents in the same company were highly consistent. For example, the r_{wg} index for firm size, firm age, and COVID-19 was well above the widely accepted threshold of 0.70. Third, we checked the responses of higher-ranked managers, who appeared significantly ($p < 0.05$) more knowledgeable about and confident in answering the questions in the survey, which justifies our choice to prioritize these respondents over others in the same export venture from the same company. Fourth, we identified no significant differences ($p > 0.05$) when comparing construct means for firms with only one informant with those for firms with multiple informants. Finally, when using responses from lower-ranked respondents for the dependent variables and moderators and replies from higher-ranked responses for the independent variables, we observed minimal changes in the results (i.e., main effects and interactions). Table SI4 provides information relating to the sample composition.

Table WA4 Sample information

Demographic characteristics	% of total companies
Main export markets	
South and Central America	42.2
North America	76
Western Europe	91.3
Eastern Europe	56.7
Asia	67.3
Australia and New Zealand	59.7
the Middle East	59.7
Russia and Eurasia	36.9
Africa	40.3
Type of industry	
Food and beverages	8.0
Pharmacy	11.8
Chemicals	10.6
Machinery	14.8
Electronics	11.4
Transportation	6.5
Information technology (IT)	15.6
Other service activities (including business and financial services)	21.3
Role description*	
Presidents/CEOs/Vice Presidents	12.5
Directors and Associate Directors	33.8
Marketing managers, Operations managers, and Sales managers	32.7
Other senior global and export positions	21.0
*On average, respondents had been with their firms for six years and in their current position for four years	

Web Appendix 5 Study measures
Table WA5.1 Questionnaire items and source

Main variables	Source
BMI novelty^a BMINOV1 – The business model offers new combinations of products, services, and information. BMINOV2 – The business model brings together business partners (e.g., customers, suppliers, associates, financiers). BMINOV3 – Incentives offered to business partners (e.g., customers, suppliers, associates, financiers) in transactions are novel. (D) BMINOV4 – The business model gives access to an unprecedented variety and number of participants and/or goods. (D) BMINOV5 – The business model links participants to transactions in novel ways. BMINOV6 – The richness (i.e., quality and depth) of some of the links between participants is novel. BMINOV7 – The firm claims to be a pioneer with its business model. (D) BMINOV8 – The focal firm has continuously introduced innovations in its business model. BMINOV9 – There are other important aspects of the business model that make it novel. BMINOV10 – Overall, the company's business model is novel (connecting previously unconnected parties, linking transaction participants in new ways, designing new transaction mechanisms).	Adapted from Zott & Amit (2007)
BMI efficiency^a BMIEFF1 – Transactions are simple from the customer's point of view. (D) BMIEFF2 – The business model enables a low number of errors in the execution of transactions. BMIEFF3 – Costs other than those already mentioned for business partners in the business model reduced (i.e., marketing and sales, transaction processing, communication costs). (D) BMIEFF4 – The business model is scalable (i.e., can handle small as well as large number of transactions). BMIEFF5 – The business model enables business partners (e.g., customers, suppliers, associates, financiers) to make informed decisions. BMIEFF6 – Transactions are transparent: flows and use of information, services, goods can be verified. BMIEFF7 – As part of the transactions, information is provided to business partners (e.g., customers, suppliers, associates, financiers) to reduce the asymmetric degree of knowledge among them regarding the quality and nature of the goods being exchanged. BMIEFF8 – Access to a large range of products, services and information, and other participants is provided BMIEFF9 – The business model enables demand aggregation. BMIEFF10 – The business model enables fast transactions. BMIEFF11 – The business model, overall, offers high transaction efficiency (transaction speed, degree of automation, breadth and depth of information provided, ease of access to potential transaction participants).	Zott & Amit (2007)
Differentiation advantage^b DIFFADV1 – Brand image DIFFADV2 – On-time delivery to customers DIFFADV3 – Pre- and/or after-sales service quality	Adapted from Spyropoulou, Katsikeas, Skarmas & Morgan (2018)
Cost advantage^b COSTADV1 – Unit production costs COSTADV2 – Raw material costs COSTADV3 – Cost of goods sold	Adapted from Spyropoulou et al. (2018)
Export performance^b EXPPERF1 – ROI EXPPERF2 – Return on sales EXPPERF3 – Export venture margins EXPPERF4 – Reaching export venture financial goals EXPPERF5 – Our export sales growth	Adapted from Spyropoulou et al. (2018)
Relational embeddedness^a RELEMB1 – We establish strategic partnership with our major export buyer/customer. RELEMB2 – We have a long-term alliance with our major export buyer/customer. RELEMB3 – We share technological information with our major export buyer/customer. RELEMB4 – We use our major export buyer's/customer's expertise in product development. RELEMB5 – We collaborate with our major export buyer/customer to solve problems. RELEMB6 – We collaborate with our major export buyer/customer to develop net requirements of products.	Kim (2014)
Competitive intensity^a COMINT1 – Competition in our industry is cutthroat. COMINT2 – There are many "promotion wars" in our industry. COMINT3 – Anything that one competitor can offer, others can readily match. (D) COMINT4 – Price competition is a hallmark of our industry. COMINT5 – One hears of a new competitive move almost every day. COMINT6 – Our competitors are relatively weak. (D)	Jaworski & Kohli (1993)
International experience SCOPE – Number of export destination countries DURATION – Number of years exporting	Assadinia, Boso, Hultman, & Robson . (2019); Freixanet & Renart (2020)

Control variables	
Complementarities ^a COMPL – Overall, the bundling of complementary products/ services is important to our business model.	Zott & Amit (2007)
Lock-in activities ^a LOCKIN – Overall, our business model succeeds in creating lock-in (direct incentives, trust and reliability, network effects, up-front investments).	Zott & Amit (2007)
Resource availability ^a RESAVA – In our firm resources needed for growth are easily available.	Wei et al. (2014)
R&D expenditure R&DEXP – Please indicate the percentage of turnover spent on research & development (R&D) in the last year.	Zott & Amit (2007)
Novelty level NOVLEV – How would you best describe the innovation activities within the business model you are currently following (new to your firm <u>but not</u> new to the industry) or (new to the firm <u>and</u> new to the industry).	Adapted from Foss & Saebi (2017)
Scope type SCOTYPE – How would you best describe the innovation approach within the business model you are currently following (modular or architectural)	Adapted from Foss & Saebi (2017)
Market turbulence ^a MARTUR1 – In our kind of business, customers’ product preferences change quite a bit over time. MARTUR2 – Our customers tend to look for new products all the time. MARTUR3 – Our firm is witnessing demand for our products and services from customers who never bought them before. (D) MARTUR4 – New customers tend to have product-related needs that are different from those of our existing customers. (D)	Jaworski & Kohli (1993)
Technological turbulence ^a TECTUR1 – The technology in our industry is changing rapidly. TECTUR2 – Technological changes provide big opportunities in our industry. (D)	Jaworski & Kohli (1993)
Firm age FAGE – Number of years the firm has been operating	-
Firm size FSIZE – Number of employees in the firm	-
Firm focus FOCUS – What is the focus of your firm’s activities? (B2B, B2C, both)	-
Industrial sector INDUSTRY – Please indicate the industrial sector your firm operates in.	-
COVID-19 COVID19 – How has COVID-19 affected your performance in the export venture market (negatively, no impact, positively)?	-

^a Based on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). ^b Based on a 7-point scale (-3 = *much worse than competitors*, +3 = *much better than competitors*).

Notes: (D) indicates that the item was dropped as a result of scale purification.

Table WA5.2 Measurement model

Factors and items	Standardized loadings ^a
BMI novelty	
BMINOV1	0.671 ^b
BMINOV2	0.703 (10.06)
BMINOV3	-
BMINOV4	-
BMINOV5	0.709 (10.14)
BMINOV6	0.729 (10.38)
BMINOV7	-
BMINOV8	0.749 (10.61)
BMINOV9	0.664 (9.56)
BMINOV10	0.733 (10.43)
BMI efficiency	
BMIEFF1	-
BMIEFF2	0.653 ^b
BMIEFF3	-
BMIEFF4	0.715 (10.13)
BMIEFF5	0.811 (11.22)
BMIEFF6	0.765 (10.70)
BMIEFF7	0.718 (10.16)
BMIEFF8	0.636 (9.17)
BMIEFF9	0.686 (9.78)
BMIEFF10	0.684 (9.76)
BMIEFF11	0.717 (10.16)
Differentiation advantage	
DIFFADV1	0.730 ^b
DIFFADV2	0.803 (6.31)
DIFFADV3	0.713 (6.04)
Cost advantage	
COSTADV1	0.768 ^b
COSTADV2	0.757 (11.26)
COSTADV3	0.816 (11.68)
Export performance	
EXPERF1	0.872 ^b
EXPERF2	0.885 (19.31)
EXPERF3	0.817 (16.81)
EXPERF4	0.806 (16.42)
EXPERF5	0.695 (12.96)
Relational embeddedness	
RELEMB1	0.731 ^b
RELEMB2	0.766 (16.01)
RELEMB3	0.673 (12.51)
RELEMB4	0.711 (11.46)
RELEMB5	0.906 (14.33)
RELEMB6	0.871 (12.93)
Competitive intensity	
COMINT1	0.695 ^b
COMINT2	0.775 (10.26)
COMINT3	-
COMINT4	0.708 (9.65)
COMINT5	0.744 (10.00)
COMINT6	-
Resource availability	
RESAVA	0.969 ^{bc}
Complementarities	
COMPL	0.980 ^{bc}
Lock-in activities	
LOCKIN	0.971 ^{bc}
Market turbulence	
MARTUR1	0.675 ^b
MARTUR2	0.994 (5.89)
MARTUR3	-
MARTUR4	-
Technological turbulence	
TECTUR1	0.976 ^{bc}
TECTUR2	-

Fit statistics:

$\chi^2_{(796)} = 1589.319$, $p = 0.000$; $\chi^2/df = 1.99$; comparative fit index CFI = 0.912; normed fit index = 0.906; root mean square error of approximation = 0.062; standardized root mean square residual = 0.061.

^a t-values from the unstandardized solution are in parentheses. ^b Item fixed to set the scale. ^c The error term was set at 0.10.

Web Appendix 6 Robustness tests and additional analyses

To assess the possibility of endogeneity, we applied the Gaussian copula estimation (Park & Gupta, 2012) to model the link between our potential endogenous variables and the regression error term of the related dependent variable. Specifically, we ran two separate estimation models. The first modeled the direct effect of novelty-centered-BMI, moderators, and all controls on differentiation advantage. The second included efficiency-centered BMI, moderators, and all the controls as predictors of the cost advantage for endogeneity. We used the REndo package in R (Gui, 2019) to compute a Gaussian copula for each of our explanatory variables. We then added copulas as an extra independent variable to each of our three regression models. These copulas control for the correlation between the error term and the corresponding potential endogenous variable. We obtained p -values for the coefficients of the copula terms using the bootstrapping technique with 5000 samples. The results show that in both regression models, the copula terms are not significant, suggesting that our explanatory variables are not subject to endogeneity bias.

Finally, in the absence of objective export performance data, we used firms' overall objective performance data to further explore associations between cost and differentiation advantages and performance. Specifically, we obtained objective data on overall return on assets (ROA) and overall return on investment (ROI) for firms in our final sample. Our analysis reveals a significant link of differentiation advantage with ROA ($\beta = 0.213, p = 0.000$) and cost advantage with ROI ($\beta = 0.210, p = 0.000$). This shows that BMI is important, in line with prior findings on the topic (see Web Appendix 1), while our analysis provides further support for the validity of the subjective measures we use and add confidence in the quality of our data.

Web Appendix 7 Summary

Table WA7 Hypotheses, results, and conclusions

Hypothesis	Results	Conclusion
Hypothesis 1. Differentiation advantage mediates the relationship between novelty-centered BMI and export performance.	Novelty-centered BMI enhances export performance through the achievement of differentiation advantage.	Support for H1.
Hypothesis 2. Cost advantage mediates the relationship between efficiency-centered BMI and export performance.	Efficiency-centered BMI enhances export performance through the achievement of cost advantage.	Support for H2.
Hypothesis 3a and 3b. Relational embeddedness strengthens the positive association between exporters' novelty-(efficiency-) centered BMI and differentiation (cost) advantages in the export market.	Relationship embeddedness has no influence on the exporter's novelty-centered BMI on differentiation advantage.	No support for H3a.
	Higher relationship embeddedness strengthens the positive association between the exporter's efficiency-centred BMI on cost advantage.	Support for H3b.
Hypothesis 4a and 4b. International experience strengthens the positive association between exporters' novelty-(efficiency-) centered BMI and differentiation (cost) advantages in the export market.	Scope of international experience weakens the positive association between the exporters' novelty-centered BMI and differentiation advantage. Duration of international experience has no influence on the association between the exporters' novelty-centered BMI and differentiation advantage.	No support for H4a.
	Scope of international experience has no influence on the link between the exporters' efficiency-centered BMI and cost advantage. Duration of international experience strengthens the positive effect of the exporters' novelty-centered BMI on differentiation advantage.	Partial support for H4b.
Hypothesis 5a and 5b. Competitive intensity strengthens or weakens the positive association between exporters' novelty-(efficiency-) centered BMI and differentiation (cost) advantages in the export market.	The positive association between exporter's novelty-centered BMI and differentiation advantage seems to be stronger when the intensity of the competition is mild.	Support for H5a.
	The intensity of the competition has no influence on the association between exporter's efficiency-centered BMI and cost advantage.	No support for H5b.
Hypothesis 6a and 6b. Competitive intensity strengthens or weakens the positive association between exporters' positional advantages (i.e., differentiation and cost) and export performance.	The higher the intensity of the competition the stronger the association between exporter's differentiation advantage and export performance.	Support for H6a.
	The higher the intensity of the competition the weaker the association between exporter's cost advantage and export performance.	Support for H6b.

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