

# Data-driven use of cross-border e-commerce platforms and export performance: The mediating role of foreign market knowledge acquisition

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## Abstract

**Frame of the research:** *Cross-border e-commerce is gaining popularity as a foreign market entry mode. Specifically, many small- and medium-sized enterprises (SMEs) choose to rely on digital e-commerce platforms (or marketplaces) that provide them with inexpensive and rapid access to a large base of potential foreign customers. The few studies available on this topic have implicitly assumed that SMEs embrace this channel with the sole intent of increasing export sales (i.e., to exploit existing opportunities). This study argues that SMEs can also implement a data-driven approach that uses cross-border e-commerce platforms as inexpensive tools to acquire foreign market knowledge by leveraging the large volume of data available on these digital platforms.*

**Purpose of the paper:** *This work proposes and tests a model in which a firm's exploration-driven use of cross-border e-commerce platforms enhances foreign market knowledge acquisition, which improves both the overall export performance of the firm and the exploitation of foreign opportunities through e-commerce.*

**Methodology:** *Partial least squares structural equation modeling was used to estimate the proposed model. Data for analysis were collected from a sample of 110 Italian exporters belonging to the food and beverage industry.*

**Results:** *The findings highlighted that the exploration-driven use of cross-border e-commerce platforms had a positive relationship with the export performance of firms. The results also implied that this effect was fully mediated by the level of foreign market knowledge (about customers, competitors, market conditions, business laws and regulations) acquired through the use of cross-border e-commerce platforms.*

**Research limitations:** *Only exporters belonging to a specific industry were considered in the empirical analysis. Thus, caution is recommended when generalizing these results.*

**Practical implications:** *The findings encourage export managers to embrace cross-border e-commerce platforms for both sales and market research purposes by deploying a data-driven approach to cross-border e-commerce platforms.*

**Originality of the study:** *To the authors' knowledge, this is the first study providing empirical evidence about the effects of using a data-driven approach to cross-border e-commerce platforms.*

**Key words:** *foreign market knowledge; platforms; data-driven approach; cross-border e-commerce; export management; export performance.*

## 1. Introduction

The use of cross-border e-commerce as a foreign market entry mode is gaining momentum among exporters (Hånell *et al.*, 2020; Tolstoy *et al.*, 2021). The United Nations Conference on Trade and Development estimated that business-to-consumer cross-border e-commerce accounted for USD 440 billion in 2019 (UNCTAD, 2021). Specifically, many small- and medium-sized exporters are captivated by cross-border e-commerce through digital e-commerce platforms or marketplaces (e.g., Amazon, eBay, and Eataly) (Matarazzo *et al.*, 2020a; Qi *et al.*, 2020). Such platforms give exporters inexpensive and rapid access to a large base of potential foreign customers and support the exportation process by providing multiple services, such as international logistics and electronic payment services (Qi *et al.*, 2020). Moreover, they provide access to a large amount of data about customers' attitudes and purchasing behaviors (Gnizy, 2019). Despite the relevance of this phenomenon, the few studies that have examined the use of cross-border e-commerce platforms have implicitly assumed that small- and medium-sized enterprises (SMEs) embrace this channel with the sole intent of increasing export sales without considering the benefits of big data on foreign customers and markets being available (Chen *et al.*, 2020).

Given the limited effort required to begin exporting through digital e-commerce platforms, SMEs can also use them as an inexpensive tool to collect foreign market knowledge, including the development of qualitative and quantitative understandings of the demand for their products (Goldman *et al.*, 2021). In other words, SMEs can opt for a data-driven approach to cross-border e-commerce platforms and use such platforms to exploit existing opportunities (i.e., increasing sales), explore foreign markets, and gain foreign market knowledge to improve export strategies (Samiee, 2020). Interestingly, recent work about e-commerce firms has suggested that an optimal balance between market knowledge exploration and exploitation is key to organizational learning and overall success (Andrews and Smits, 2021). Specifically, research about e-tailers has assessed that the interaction between exploitation and organizational learning positively affects firm performance (Dhir and Dhir, 2018). However, the extant research has not studied the effects of the exploitation- and exploration-driven uses of cross-border e-commerce platforms on export performance.

The present work addresses the aforementioned gap by proposing and testing a model in which a firm's exploration-driven use of cross-border e-commerce platforms enhances foreign market knowledge acquisition, which improves both the overall export performance of the firm and the exploitation of foreign opportunities through e-commerce. The model was tested using a sample of Italian small- and medium-sized exporters. Over the last few years, the number of Italian SMEs adopting cross-border e-commerce has been growing (Bertoli, 2017). This trend has been fostered by specific policies of the Italian Trade Agency (i.e., the Italian Trade Promotion Organization), which has signed agreements with 32 e-commerce platforms in 31 countries to facilitate access to cross-border

e-commerce by Italian SMEs (Italian Trade Agency, 2021). In this study, we specifically considered exporters from the food and beverage industry (the second most important business-to-consumer industry for Italian cross-border e-commerce (Italian Trade Agency, 2021)), which have added this new entry mode (i.e., cross-border e-commerce platforms) to their traditional offline entry modes that were largely based on relationships with importers and distributors.

Therefore, this study offers new insights about foreign market knowledge acquisition through a data-driven approach to cross-border e-commerce platforms. The international business and marketing literature has widely shown that the outcomes of the internationalization process of a firm largely depend on the firm's ability to accumulate foreign market knowledge and use it to inform market strategies (Fletcher *et al.*, 2013). However, even the most recent studies about digital technologies and foreign market knowledge (Ghauri *et al.*, 2021), despite having introduced the idea of "international digital platform orientation" to collect customer data (Akter *et al.*, 2021), have yet to empirically examine the effects of the data-driven use of cross-border e-commerce platforms to gain foreign market knowledge and its effects on export performance.

The results of this study also provide export managers with practical evidence about the different purposes that cross-border e-commerce platform use may serve, specifically regarding the collection of knowledge, while highlighting the effects on the overall export performance. Specifically, the findings of this research urge export managers to approach this entry mode not only as an additional channel to increase sales but also as a data-driven opportunity to gain and strengthen their foreign market knowledge.

## 2. Theoretical background and research hypotheses

### 2.1 Theoretical background

Foreign market knowledge acquisition has received strong consideration in international business and international marketing theories to explain the outcomes of the internationalization process of firms. However, while the conceptual explanations of foreign market knowledge acquisition have evolved over time, the role of cross-border e-commerce platforms has not yet been considered. The early conceptualizations developed by the Uppsala School emphasized the role of experiential knowledge, which is the knowledge that is gradually obtained only through personal experience in managing foreign operations (Johanson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975). On the contrary, subsequent studies found that early and rapidly internationalizing firms that were driven by their entrepreneurial orientation quickly accumulated foreign market knowledge by accessing relationships networks (Casillas *et al.*, 2015; Cavusgil and Knight, 2015; Oviatt and McDougall, 1994; Zhou, 2007). More recent research has highlighted the role of new digital technologies in enabling firms to easily acquire foreign market knowledge, such as by interacting with

online communities through social media (Ghauri *et al.*, 2021; Katsikeas *et al.*, 2020). As a result, the new internet-based communication technologies “enable businesses to identify and exploit market opportunities faster and across wider geographic areas than was previously possible” (Watson IV *et al.*, 2018, p. 43). Specifically, recent research about data-rich environments in international business has suggested that digital platforms enable firms to collect a large amount of customers’ transactional data and proposed that “data-driven digital platform orientation” in international marketing can enhance the international performance of a firm (Aker *et al.*, 2021). Nonetheless, even these contemporary studies have yet to empirically evaluate the effects of using cross-border e-commerce platforms for exploration purposes to gain foreign market knowledge.

The few available works on cross-border e-commerce have considered it as an entry mode only for exploitation but not for exploration purposes (Chen *et al.*, 2020). According to the debate on ambidexterity in the international business domain, firms must combine exploration and exploitation endeavors to successfully operate in international markets (Zhou *et al.*, 2020). The formation and exploitation of opportunities across borders are also at the core of international entrepreneurship, which represents a key field in the current international business literature (Zucchella, 2021). The exploration-exploitation perspective can be applied to multiple domains (Voss and Voss, 2013). In this paper, we focus on the market domain, which includes the exploration of new market/customer knowledge and the exploitation of existing market/customer knowledge (Voss and Voss, 2013). Hence, the concept of exploitation indicates the tendency of firms to capitalize on their existing resources and capabilities (Christofi *et al.*, 2021) to capture value from existing foreign market/customer knowledge (Zhou *et al.*, 2020). The concept of exploration encompasses firms’ efforts to innovate their existing resources and capabilities (Christofi *et al.*, 2021) and specifically to identify new opportunities to create value through new foreign market/customer knowledge (Zhou *et al.*, 2020).

Available studies on cross-border e-commerce have explicitly or implicitly considered cross-border e-commerce as an entry mode added by exporters to their existing offline entry modes (mainly through importers and distributors) to boost the exploitation of sales opportunities in foreign markets (Cassia and Magno, 2021; Elia *et al.*, 2021). This view is also consistent with the arguments brought forward by Samiee (2020), who suggested that current exporters are more likely to benefit from this export model to expand their export sales. Current definitions of cross-border e-commerce focus on the exploitation of sales opportunities in foreign markets. For example, according to an official study by the European Commission, “the term ‘cross-border e-commerce’ defines international online trade. It entails the sale or purchase of products on the internet across national borders” (European Commission, 2019).

Consistent with the cited prior works, this study only considered firms that adopted cross-border e-commerce as an additional entry mode to their existing offline entry modes. However, contrary to the cited work, we embraced a data-driven view of cross-border e-commerce platforms (Aker *et al.*, 2021) and suggest that this may serve not only to boost sales

(exploitation) but also as a tool to enhance foreign market knowledge (exploration) to improve exporters' overall export strategies. On this point research about data-driven contexts has shown that data-driven knowledge can provide higher benefits to traditional firms than to pure online and technological firms, because it enables their managers to take decisions based on evidence instead of intuition (Ferraris *et al.*, 2019).

Cross-border e-commerce platforms (e.g., Amazon, JD.com, and Alibaba) have dramatically reduced the investment required to start cross-border e-commerce when compared to exporters establishing their own e-commerce websites. Such platforms facilitate transactions between exporters and foreign customers in multiple ways by reducing exporters' costs of searching for customers and by increasing customers' trust in exporters' products and reliability (Qi *et al.*, 2020). Additionally, beyond providing access to a large base of potential customers, the most established platforms provide multiple services such as international logistics (including warehousing and rapid deliveries) and electronic payment services, which make cross-border e-commerce easily accessible to SMEs (Wang *et al.*, 2020).

Furthermore, cross-border e-commerce platforms enable more efficient information flows among the actors involved, so that "through communication with customers [...] companies can obtain targeted, content-specific and valuable market information" (Wang *et al.*, 2020, p. 74). Market knowledge is further strengthened by product reviews, recommendations posted by customers on the platforms, and the real-time analytics that platforms make available to exporters. For example, through its Seller Central (an online dashboard), Amazon provides merchants with multiple analytics and reports to evaluate their performance, which includes data on product views, the products most frequently purchased on the same day that Amazon customers viewed (but did not purchase) the merchants' products, and demographics reports on merchants' customers<sup>1</sup>. Therefore, the use of cross-border e-commerce platforms can provide exporters not only with sales opportunities but also with easy access to big data about the market and customers' attitudes and purchase behaviors, which can enhance export strategies (Akter *et al.*, 2021). Available research specifically addressing data-driven environments corroborates this view, as it has highlighted that data-driven knowledge can positively affect firm performance by improving the quality of managerial decisions (Ferraris *et al.*, 2019; Lestari *et al.*, 2020).

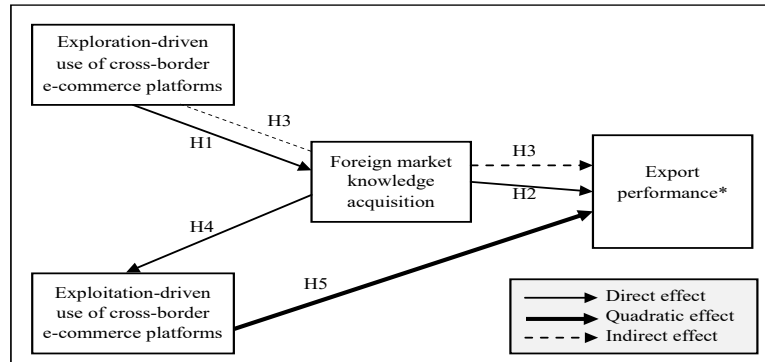
By drawing on these arguments, the present paper suggests a model (Figure 1) in which the motivations for using cross-border e-commerce platforms are distinguished between exploration purposes ("Exploration-driven use of cross-border e-commerce platforms") and exploitation purposes ("Exploitation-driven use of cross-border e-commerce platforms"). Additionally, the model suggests that the exploration-driven use of cross-border e-commerce platforms has a positive effect

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<sup>1</sup> Some of these analytics are only available in some markets. A detailed description of the mentioned metrics and all of the other metrics and reports made available to merchants can be found at the website <https://sellercentral.amazon.com/>.

on the overall export performance of the firm and that this effect is fully mediated by foreign market knowledge acquisition (H1, H2, and H3). Moreover, foreign market knowledge acquisition positively influences the exploitation-driven use of cross-border e-commerce platforms (H4). Finally, the exploitation-driven use of cross-border e-commerce platforms has a non-linear (inverted U-shaped) effect on the overall export performance of the firm (H5). Hereafter, the hypotheses are presented in detail.

Fig. 1: Model and hypotheses



\*Control variables: firm size (number of employees); international experience of the firm (number of years).

Source: Authors' elaboration.

## 2.2 Research hypotheses

As argued by Samiee (2020), it is self-evident that when firms gain experience in selling internationally via the internet, they also collect greater knowledge about host markets. However, the rationale behind our model is more specific since we considered the extent to which an exporter intentionally deploys a data-driven approach to cross-border e-commerce platforms from the beginning while also using these platforms as a way to collect foreign market knowledge (i.e., “exploration-driven use of cross-border e-commerce platforms” in the model). Thus, we focused on a deliberate orientation to data-driven knowledge management (Chen *et al.*, 2022). Specifically, following the established conceptualizations, in this paper foreign market knowledge is defined as the business knowledge “pertaining to customers, competitors and market conditions in particular foreign markets” (Zhou, 2007, p. 282). Due to the low cost and effort involved in accessing foreign markets when using cross-border e-commerce platforms, as well as the large amount of data about customers that such platforms make available (Gnizy, 2019), exporters can (also) use this entry mode as an inexpensive alternative to other market research techniques in order to identify new opportunities (i.e., new appealing segments or markets). Therefore, we posit that the more intense the exporters’ exploration-driven attitude, the stronger their acquisition of

foreign market knowledge from the data, information, and reports available through e-commerce platforms. In summary, we hypothesized that that:

*H1. The exploration-driven use of cross-border e-commerce platforms has a positive effect on foreign market knowledge acquisition.*

A number of studies have provided rich evidence of the effects of knowledge acquisition on the international performance of a firm (Zahoor and Al-Tabbaa, 2021). This work considers a specific type of performance-export performance-that has been examined from multiple perspectives encompassing financial and strategic evaluations as well as exporters' satisfaction (Madsen and Moen, 2018; Stoian *et al.*, 2011; Zou *et al.*, 1998). In this study, we adopted the financial perspective and followed the well-established EXPERF scale, which considers exporters' evaluation of their export venture sales, profitability, and growth (Zou *et al.*, 1998). Prior research has extensively demonstrated the existence of positive relationships between the foreign market knowledge acquired by a firm and its export performance (Haahti *et al.*, 2005; Sousa *et al.*, 2008). Therefore, we hypothesized that:

*H2. Foreign market knowledge acquisition has a positive effect on export performance.*

To gain a comprehensive understanding of the effect of the exploration-driven use of cross-border e-commerce platforms on export performance, the model hypothesized the existence of an indirect relationship mediated by foreign market knowledge acquisition (Figure 1). In other words, this study suggests that the exploration-driven use of cross-border e-commerce platforms has a positive effect on foreign market knowledge acquisition (as posited in H1) and, in turn, foreign market knowledge acquisition has a positive effect on export performance (as posited by H2). However, we claim that the exploration-driven use of cross-border e-commerce platforms does not directly affect export performance. The few available studies hypothesizing the direct effects of exploration on export performance have reported mixed findings. For example, while Yan *et al.* (2021) found a positive effect, while Lisboa *et al.* (2013) registered a weak negative effect. Interestingly, to explain the (unexpected) negative relationships, Lisboa *et al.* (2013, p. 225) argued that exploration "requires significant cash flow" and thus negatively impacts export performance. The generalizability of these findings to cross-border e-commerce through platforms is questionable because-as previously mentioned-exporters incur relatively low costs to access these platforms and the big data available through them. More importantly, we argue that the mixed and unexpected findings regarding the direct relationship between exploration and export performance is explained by the fact that the systematic influence of the mediator (i.e., foreign market knowledge acquisition) has not been accounted for (Hair *et al.*, 2017). Therefore, by also drawing on the direct effects presented in H1 and H2, we hypothesized that:

*H3. The exploration-driven use of cross-border e-commerce platforms has a positive effect on export performance and this effect is fully mediated by foreign market knowledge acquisition.*

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The acquisition of foreign market knowledge provides firms with awareness about new opportunities (e.g., new segments and/or new markets) that can be exploited through cross-border e-commerce (Lisboa *et al.*, 2013). Moreover, it provides valuable inputs for innovating marketing strategies that better fit customers in the target foreign markets, which could improve the exploitation of existing opportunities (Hånell *et al.*, 2020). For example, Zhao (2018) argued that data-driven knowledge can support companies involved in cross-border e-commerce to adapt their pricing strategy dynamically. In other words, the exploration-driven use of cross-border e-commerce platforms can provide new knowledge that can be exploited (Yan *et al.*, 2021). Hence, we hypothesized that:

*H4. Foreign market knowledge acquisition is positively related to the exploitation-driven use of cross-border e-commerce platforms.*

Prior research has argued that the relationship between export market exploitation and export performance is a nonlinear one because the returns on working with the same knowledge become diminishing (Lisboa *et al.*, 2013). Starting from this point, more specific arguments can be developed to explain the effect of the exploitation-driven use of cross-border e-commerce platforms on the export performance of a firm. Sinkovics *et al.* (2013) argued that exporters may incur in the so-called “virtuality trap” if they excessively rely on online internationalization since online interactions make it difficult to fully appreciate the complexities of foreign markets. Moreover, if exporters focus too much on cross-border e-commerce and overlook the need for a physical presence, their performance in foreign markets will decline (Sinkovics *et al.*, 2013). Samiee (2020, pp. 429-430) specifically noted that “for tangible and particularly time-sensitive goods such as food items<sup>2</sup>, local market presence is essential. As the volumes of internet-based transaction for the tangible product grows, so does the need for host-market or regional infrastructures”. However, since such host-market infrastructure is usually built on relationships with importers and distributors, the heavy adoption of cross-border e-commerce may create multi-channel conflicts that result in partners’ decreasing commitment and performance (Watson IV *et al.*, 2018). Additional arguments indicate that as the volume of cross-border e-commerce increases, the complexity of this entry mode also increases due to logistical issues (e.g., managing a large number of small orders and their shipping) and the variety of duty regimes and tax laws (Cassia and Magno, 2021; Elia *et al.*, 2021). In summary, “e-commerce platforms do not remove all information asymmetries related to cross-border transactions” (Hånell *et al.*, 2020, p. 527). Based on this argument, we expect that the relationship between the exploitation-driven use of cross-border e-commerce platforms and export performance will have an inverted U-shape. This implies that the exploitation-driven use of cross-border e-commerce platforms will positively impact export performance until a certain point, beyond which each further increase in the exploitation-driven use of cross-border e-commerce platforms will decrease export performance. Therefore, we hypothesized that:

<sup>2</sup> The empirical study presented in the next sections of this paper was specifically focused on the food and beverage industry.



H5. *There is an inverted U-shaped relationship between exploitation-driven use of cross-border e-commerce platforms and export performance.*

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As shown in Figure 1, the model also included two control variables—i.e., firm size and international experience—that can influence the export performance of a firm and have also been used as control variables in studies linking exploration and exploitation to performance (Voss and Voss, 2013).

### 3. Methods

The study adopted a cross-sectional approach by collecting data from a sample of Italian exporters that satisfied the following inclusion criteria: (1) being SMEs (up to 250 employees); (2) having adopted cross-border e-commerce through platforms in addition to other traditional entry modes (e.g., relationships with offline distributors); (3) autonomously managing cross-border e-commerce (i.e., we excluded cases of indirect export modes); (4) belonging to the food and beverage industry. In particular, we selected this industry because it provided access to a sufficiently large number of firms that adopted cross-border e-commerce through platforms. Moreover, it represents the second largest industry contributing to Italian cross-border e-commerce and is also the fastest-growing industry in this regard (Italian Trade Agency, 2021). Overall, Italian food is highly appreciated in foreign markets, where it is purchased not merely for functional purposes but for the hedonic and cultural values it conveys and as an expression of the “Italian way of life” (Bertoli, 2016, p. 4).

The link to an online questionnaire was sent to a list of 426 firms obtained by inspecting three popular cross-border e-commerce platforms (Amazon.com, Eataly.com, and Alibaba.com). After two reminders, 121 questionnaires were returned. After checking that respondents met the inclusion criteria, 11 questionnaires were excluded because they either did not autonomously manage cross-border e-commerce (10 cases) or they were not SMEs (1 case). Therefore, the final sample size was 110 firms, which met the sample requirement to run the partial least squares structural equation modeling (PLS-SEM) for our model. This method requires the sample to be 10 times larger than the largest number either of formative indicators used to measure one constructs or of the structural paths directed at a particular construct (Hair *et al.*, 2017).

The questionnaire consisted of questions about firm demographics (including firm size and the years of international experience of the firm, which were then included in the model estimation as control variables) and multiple-item measures of the constructs included in the model. An overview of firm demographics is provided in Table 1. In addition to cross-border e-commerce, importers and distributors are the most frequently adopted offline entry modes. For 59.09% of the respondents, cross-border e-commerce accounted for less than 10% of the total export sales.

Tab. 1: Firm demographics

Variable	Frequency (n = 110)
Number of employees	
1-10	53
11-50	36
51-250	21
International experience of the firm (number of years)	
< 5	18
6-10	16
11-15	13
16-20	13
21-30	29
30+	21
International presence (number of countries)	
1	4
2-5	37
6-10	25
11-20	13
20+	31
Entry modes	
Cross-border e-commerce platforms*	110
Importers	80
Distributors	73
Brokers or foreign buyers	14
Trading companies	11
Export consortia	11
Other modes	27

\*In some cases, firms have also implemented their own e-commerce websites.

Source: Authors' elaboration.

Measures of the four constructs included in the model were drawn from prior research and adapted to fit cross-border e-commerce. The complete list of items is shown in Table 2. Specifically, the exploration- and exploitation-driven uses of cross-border e-commerce platforms were measured by four and three items, respectively, that were adapted from Lisboa *et al.* (2013). These two scales assessed the extent to which a firm used cross-border e-commerce platforms to perform market exploration and exploitation activities (1 = no extent; 5 = great extent). Foreign market knowledge acquisition was measured based on four items from Zahoor and Al-Tabbaa (2021) to register the level of foreign market knowledge (i.e., about customers, competitors, market conditions, business laws, and regulations) acquired from using cross-border e-commerce platforms (1 = very little; 5 = extensive). Export performance was measured by the three items of the EXPERF scale, which assesses exporters' evaluations of their export ventures' financial performance in terms of sales, profitability, and growth (1 = strongly disagree; 5 = strongly agree). PLS-SEM with SmartPLS 3 was used for data analysis. This method is different from covariance-based structural equation modeling (CB-SEM) due to its characteristics (i.e., a nonparametric method that makes no distributional assumptions) and primary purpose (Hair *et al.*, 2017; Hair *et al.*, 2020). It is particularly suitable for prediction-oriented evaluations of research models (Hair *et al.*, 2019; Shmueli *et al.*, 2019). For this reason, PLS-SEM was chosen for

this empirical analysis, which intended to assess both the in-sample and out-of-sample predictive power of the model. Moreover, this method has frequently been applied in studies within the international business field (Magnani and Zucchella, 2020).

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## 4. Results

### 4.1 Assessment of the measurement models

Consistent with the original scales, the four constructs were modeled as reflective. Hence, their evaluation covered indicator loadings, internal consistency reliability, convergent validity, and discriminant validity (Hair *et al.*, 2017). All indicator loadings (Table 2) were greater than 0.708 (except for one loading, which was equal to 0.655), indicating that indicator reliability had been met (Hair *et al.*, 2019). Moreover, for all constructs, the values of composite reliability, Cronbach's alpha, and exact reliability  $\rho_A$  were all greater than 0.70 (Table 3). Hence, internal consistency reliability was assessed (Dijkstra and Henseler, 2015; Hair *et al.*, 2019). Convergent validity was also confirmed because the values of the average variance extracted (AVE) were greater than the value of 0.50 for all constructs (Hair *et al.*, 2019) (Table 3). Additionally, the square root of each construct's AVE was greater than its highest correlation with any other construct, thus meeting the Fornell-Larcker criterion (Fornell and Larcker, 1981). Finally, all heterotrait-monotrait ratios of the correlations (HTMT) were below the cutoff of 0.85 and significantly different from 1 (Henseler *et al.*, 2015). Hence, discriminant validity was assessed (Hair *et al.*, 2019).

Tab. 2: Measurement scales

Construct	Item	Mean	Standard deviation	Kurtosis	Skewness	Outer loading
Exploration-driven use of cross-border e-commerce platforms (Lisboa <i>et al.</i> , 2013)	To what extent does your firm use cross-border e-commerce platforms to <sup>a</sup> :					
	Assess the potential of new markets	3.336	1.208	-0.909	-0.017	0.934
	Identify prospective customer segments	3.273	1.264	-0.905	-0.201	0.889
	Collect customer feedback and data	3.518	1.277	-0.820	-0.413	0.888
	Assess the competitiveness of your product	3.327	1.222	-0.759	-0.167	0.944
Exploitation-driven use of cross-border e-commerce platforms (Lisboa <i>et al.</i> , 2013)	To what extent does your firm use cross-border e-commerce platforms to <sup>a</sup> :					
	Increase sales in your export markets	3.782	1.253	-0.541	-0.758	0.828
	Reach new customers in your export markets	3.664	1.281	-0.688	-0.634	0.829
	Improve sales efficiency in your export markets	3.509	1.299	-1.086	-0.361	0.917
Foreign market knowledge acquisition (Zahoor and Al-Tabbaa, 2021)	Please indicate the level of foreign market knowledge acquired from using cross-border e-commerce platforms in relation to <sup>a</sup> :					
	Customer needs	3.973	1.004	0.648	-0.982	0.655
	Competitors	3.927	1.015	0.030	-0.803	0.711
	Market conditions	3.682	0.914	-0.050	-0.263	0.852
	Business laws and regulations	3.400	1.200	-0.530	-0.465	0.833
Export performance (Zou <i>et al.</i> , 1998)	This export venture <sup>b</sup> :					
	has been very profitable	3.636	0.760	-0.164	-0.284	0.817
	has generated a high level of sales	3.564	0.977	-0.431	-0.270	0.912
	has achieved rapid growth	3.536	1.006	-0.082	-0.698	0.853

<sup>a</sup> 1 = no extent; 5 = great extent; <sup>b</sup> 1 = very little; 5 = extensive; <sup>c</sup> 1 = strongly disagree; 5 = strongly agree.

Source: Authors' elaboration.

Tab. 3: Reliability and validity statistics

Latent variable	Cronbach's alpha	rho_A	Composite reliability	Average variance extracted (AVE)
Exploration-driven use of cross-border e-commerce platforms	0.934	0.949	0.953	0.835
Exploitation-driven use of cross-border e-commerce platforms	0.828	0.923	0.894	0.738
Foreign market knowledge acquisition	0.768	0.796	0.850	0.589
Export performance	0.826	0.834	0.896	0.743

Source: Authors' elaboration.

#### 4.2 Structural model assessment

The significance and relevance of the structural model relationships were assessed using the bootstrapping routine (with 5,000 subsamples, bias-corrected and accelerated bootstrap, two-tailed test). The results of the estimation are presented in Table 4. Before analyzing the structural relationships, we checked the values of the inner variance inflation factor (VIF) and assessed that they were below the threshold of 5 (highest value: 1.352). Therefore, we confirmed the absence of collinearity and thus proceeded with the analysis of the structural model relationships (Hair *et al.*, 2017).

Tab. 4: Model estimates

HP	Effects	Path coefficients	t values	95% confidence intervals
H1	Exploration-driven use of cross-border e-commerce platforms → Foreign market knowledge acquisition	0.540	7.882**	[0.402, 0.670]
H2	Foreign market knowledge acquisition → Export performance	0.421	5.505**	[0.262, 0.558]
H4	Foreign market knowledge acquisition → Exploitation-driven use of cross-border e-commerce platforms	0.413	4.556**	[0.243, 0.597]
H5	(Exploitation-driven use of cross-border e-commerce platforms) <sup>2</sup> → Export performance	-0.235	2.410*	[-0.438, -0.056]
H5	Exploitation-driven use of cross-border e-commerce platforms → Export performance	0.006	0.067	[-0.179, 0.204]
	Specific indirect effect			
H3	Exploration-driven use of cross-border e-commerce platforms → Foreign market knowledge acquisition → Export performance	0.227	4.006**	[0.123, 0.340]
	Control variables' effects			
-	International experience → Export performance	0.145	2.169*	[-0.001, 0.260]
-	Firm size → Export performance	0.302	4.653**	[0.177, 0.435]

\*p < 0.05; \*\*p < 0.01

Source: Authors' elaboration.

The findings indicated that the exploration-driven use of cross-border e-commerce platforms was positively related to foreign market knowledge acquisition ( $\beta = 0.540$ ,  $p < 0.01$ ), which positively influenced export performance ( $\beta = 0.421$ ,  $p < 0.01$ ). Therefore, H1 and H2 were supported. Additionally, the specific indirect effect linking the exploration-driven use of cross-border e-commerce platforms to export performance through foreign market knowledge acquisition was significant and positive ( $\beta = 0.227$ ,  $p < 0.01$ ). To further assess the mediating role of foreign market knowledge acquisition, we re-estimated the model by adding a direct effect between the exploration-driven use of cross-border e-commerce platforms and export performance. The analysis confirmed that this direct effect was nonsignificant. Therefore, H3 (indicating that the exploration-driven use of cross-border e-commerce platforms had a positive effect on export performance and that this effect was fully mediated by foreign market knowledge acquisition) was supported. Moreover, foreign market knowledge acquisition was positively related to the exploitation-driven use of cross-border e-commerce platforms ( $\beta = 0.413$ ,  $p < 0.01$ ), which provided support for H4. Moreover, the analysis highlighted that the exploitation-driven use of cross-border e-commerce platforms and export performance were linked by a significant and negative quadratic relationship ( $\beta = -0.235$ ,  $p < 0.05$ ), while the linear relationship between the two variables was nonsignificant ( $\beta = 0.006$ ,  $p > 0.10$ ). Hence, H5 was supported, thereby confirming that there was an inverted U-shaped relationship between the exploitation-driven use of cross-border e-commerce platforms and export performance. Finally, the effects of the two control variables were both significant, thereby confirming that firms with more international experience ( $\beta = 0.145$ ,  $p < 0.05$ ) and a larger size ( $\beta = 0.302$ ,  $p < 0.01$ ) enjoyed higher export performance.

The in-sample and out-of-sample predictive power were then evaluated. The value of the coefficient of determination  $R^2$  for the target construct “export performance” was equal to 0.448. Then, the blindfolding procedure with an omission distance of 7 was run. This procedure obtained a  $Q^2$  value for export performance that was greater than 0 ( $Q^2=0.279$ ). Therefore, both the in-sample and out-of-sample predictive power of the model were satisfactory (Hair *et al.*, 2019).

## 5. Discussion

### 5.1 Theoretical implications

The present study contributed to advancing the current understanding of cross-border e-commerce in multiple ways by adopting a data-driven perspective. First, the findings demonstrate the beneficial effects that exporters can enjoy if they intend to use cross-border e-commerce platforms not only as tools to boost sales but also as sources of valuable data to enhance foreign market knowledge. Therefore, this research complements the prevailing view, which emphasizes the role of cross-border e-commerce platforms as enablers of easy and rapid access to foreign markets while

overlooking their value as data-rich environments that can enhance a firm's market knowledge (Chen *et al.*, 2020; Wang *et al.*, 2020). Hence, this work extends existing knowledge of the positive effects on firm performance arising from an appropriate balance of exploration and exploitation, as highlighted in the available literature on ambidexterity (He and Wong, 2004). Specifically, this analysis demonstrates the generalizability of prior findings related to ambidexterity in e-commerce firms (Andrews and Smits, 2021; Dhir and Dhir, 2018) to the case of cross-border e-commerce by providing specific arguments about knowledge accumulation and application from the international business literature (Ghauri *et al.*, 2021). In other words, this study confirms that the contribution of e-commerce platforms to the internationalization of firms goes well beyond simply selling products abroad (Samiee, 2020).

Furthermore, the findings of this study provide the first empirical evidence to substantiate recent arguments suggesting that the appropriate use of data-driven digital platforms can improve the international performance of a firm (Akter *et al.*, 2021; Gnizy, 2019). More specifically, the results of this research give support to the proposition developed by Akter *et al.* (2021, p. 936), who argued that "Big data-driven digital platform orientation in international marketing enhances sustained international growth/performance." Our study not only proves the existence of such an effect but also explains the underlying mechanisms by drawing on a stream of studies related to ambidexterity in international business (Lisboa *et al.*, 2013). Moreover, the present study contributes to enriching the ongoing debate about the positive relationship between a firm's big data orientation and its performance (Ferraris *et al.*, 2019). Our research indicates that firms that intentionally use information obtained from their cross-border operations to enhance their foreign market knowledge can obtain higher performance.

From a broader perspective, this research offers new insights into the ongoing debate on the digital transformation of SMEs and its effects on their internationalization strategies (Matarazzo *et al.*, 2020b). Several studies have noted that SMEs are embracing new digital technologies, including e-commerce, to expand their international reach (Ghauri *et al.*, 2021; Matarazzo *et al.*, 2020a). This work emphasizes that the different approaches with which the firms implement these new technologies have a strong influence on their performance. Specifically, exporters can experience greater benefits when they adopt a data-driven approach to cross-border e-commerce and use it to both explore and exploit foreign market opportunities. Moreover, this study provides support to prior research noting that "companies that were born digital [...] are already using big data [...]. But the potential to gain competitive advantage may be even greater for other companies" (Ferraris *et al.*, 2019, p. 1923). This work demonstrates the beneficial effects experienced by traditional exporters belonging to a mature industry (e.g., food and beverage) adopting a data-driven approach (Matarazzo *et al.*, 2020a).

Moreover, the findings of this study confirm the well-established role of foreign market knowledge in explaining the export performance of firms (Denicolai *et al.*, 2014). Additionally, they indicate how a data-driven

approach to cross-border e-commerce platforms may offer rich and updated inputs that can be used to continually update knowledge. Therefore, these data-rich environments can represent a valuable opportunity for SMEs to continuously innovate their knowledge and capabilities to sustain their competitive advantage in foreign markets (Moretta Tartaglione, 2018).

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## 5.2 Managerial implications

From a managerial perspective, the findings encourage SMEs' export managers to embrace cross-border e-commerce through platforms for both sales and market research purposes by deploying a data-driven approach to cross-border e-commerce platforms. Many SMEs tend to consider cross-border e-commerce as simply an additional foreign market entry mode to increase foreign sales. In particular, the present study demonstrates how the new data-driven approach can be beneficial for exporters belonging to mature industries (e.g., food and beverage). Notably, rich and updated market knowledge obtained through cross-border e-commerce operations can improve the quality of managerial decisions. Rich evidence demonstrates that the international marketing decisions adopted by many SMEs are often based on intuition without the support of market analyses, which are perceived as too expensive and time-consuming. However, this approach often results in poor export performance (Bertoli and Valdani, 2018). Hence, using cross-border e-commerce with a data-driven orientation can represent an opportunity to solve this problem by enabling exporters to access unexpensive and updated knowledge, thereby reducing the risk of failure in a foreign market.

Notably, the transition to a data-driven perspective may be slowed by the cultural change required (Troilo *et al.*, 2017). Moreover, to gain actionable insights, SMEs must develop specific knowledge management capabilities to correctly acquire and analyze the data obtained from cross-border e-commerce. For exporting SMEs, this transition may be facilitated by cooperation with a temporary export manager (TEM) or, more specifically, a digital temporary export manager (D-TEM). Through such time-limited cooperation, export SMEs can acquire specific knowledge and capabilities, as well as a proper method, to approach cross-border e-commerce for both exploration and exploitation purposes.

However, the findings of this study not only demonstrate the benefits of a data-driven approach but also the risks of not adopting one. When cross-border e-commerce platforms are excessively used for exploitation purposes alone, the returns on performance decrease after a certain point—as shown by the inverted U-shaped relationships between the exploitation-driven use of cross-border e-commerce platforms and export performance. As documented in the existing international marketing literature (Sinkovics *et al.*, 2013), when exporters excessively rely on online transactions without considering continuous foreign market learning, they often experience the “virtuality trap,” which negatively affects their overall performance. These findings also suggest multiple opportunities that involve multi-channel strategies. For example, exporters may use a data-driven approach to cross-border e-commerce platforms to collect evidence

about the foreign market demand for their products and then use those data to negotiate new agreements with distributors and importers.

## 6. Conclusions

Cross-border e-commerce platforms have opened up new opportunities for SMEs interested in developing their presence in foreign markets. However, the relatively few studies on this topic have largely addressed cross-border e-commerce platforms as mere sales channels and not as data-rich environments. By adopting a data-driven approach, this study has shown that exporters can leverage the large volume of data made available by and through digital platforms to expand their foreign market knowledge and improve their export performance. As a result, this work highlighted the need to approach cross-border e-commerce for both market knowledge exploration and opportunity exploration purposes. Overall, by building on existing literature related to cross-border e-commerce (Cassia and Magno, 2021; Elia *et al.*, 2021) and ambidexterity (Andrews and Smits, 2021; Lisboa *et al.*, 2013), this work contributes to advancing the nascent stream of studies on data-driven approaches in international marketing strategies (Akter *et al.*, 2021).

Nonetheless, several limitations should be considered when interpreting the results of this study. First, the empirical analysis relied on a sample of firms belonging to only one industry (i.e., the food and beverage industry) in one country. Some specific features of this context—such as the need to convey the intangible value of these products (offline) and their traditional methods of production (Mainolfi and Marino, 2020)—may have influenced some of the results, including the relationships between the exploitation-driven use of cross-border e-commerce and export performance. In foreign markets, Italian food is typically purchased for its cultural and hedonic value by customers aiming to experience the “Italian way of life” through the consumption of Italian food (Bertoli, 2016). Thus, future research should consider firms from multiple countries and industries to corroborate our findings. Specifically, cross-country and cross-cultural studies may enrich our understanding of the phenomenon, thereby making it possible to detect the potential existence of a “cultural effect.” Moreover, all of the firms considered in this study added e-commerce to their existing offline foreign market entry modes, with e-commerce accounting for a small share of their total export revenues in most cases. Hence, it would be interesting to replicate this study while considering internet-based firms and firms for which cross-border e-commerce generates a higher share of the revenue. Furthermore, since this study adopted a cross-sectional research design, future research could adopt a longitudinal approach to better assess the medium- and long-term effects of the exploration- and exploitation-driven uses of cross-border e-commerce on performance. Future research could also assess the adoption of data-driven approaches to cross-border e-commerce by using a micro-foundations perspective (Christofi *et al.*, 2021) to examine the perspectives of (export) managers.



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