

Resources and digital export: An RBV perspective on the role of digital technologies and capabilities in cross-border e-commerce

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Abstract

Building on the resource-based view (RBV) perspective of the firm and firms' competitive capabilities, this study examines the digital export drivers as means for firms to exploit the opportunities brought about by digital technologies in their B2C digital marketing activities. By leveraging a unique dataset covering 102 Italy-based firms of different size (small, medium, and large) active in three different sectors (design & furniture, fashion, food & beverage), this work examines the role of firm resources to support internationalization via digital channels. We find that: 1) SMEs do not suffer from a weaker propensity to engage with digital export despite resources constraints; 2) firms leveraging digital technologies are more likely to enhance their digital export; 3) digital capabilities are critical as firms employing an e-commerce manager have a higher propensity to undertake digital export than firms relying on a traditional export manager.

Keywords: digital transformation; digital export; cross-border e-commerce; digital export capabilities; internationalization; resource-based view; firms' capabilities.

1.Introduction

Firms are currently facing increasing levels of uncertainty and complexity due to a fast-paced environment (Ghobadian et al., 2020; Hoisl et al., 2020) where achieving and maintaining a sustained competitive advantage even over short periods of time is progressively more difficult (D'Aveni et al., 2010; Lindskov et al., 2021; Mahto et al., 2018).

One of the major challenges for firms today is to adapt to technological development and embrace the ongoing industrial revolution which has mainly a digital nature (Schwab, 2017). This is true especially for enterprises that were not born digital and not born global (Hennart, 2014; Wamba and Queiroz, 2020) and are willing to expand their global market share through internationalization. For these companies, digital transformation is a necessary cost-effective means of gaining international competitive advantage. One of the most effective strategies to pursue this goal is to engage in digital export, i.e. using e-commerce to access new international markets.

Relying on the Resource-Based View (RBV) theory (Barney, 1991, 2001), the strategic management literature has shown that firms can achieve a competitive advantage by means of (tangible and intangible) resources, which need to be recombined and coordinated through strategic capabilities (e.g., Amit and Schoemaker, 1993; McEvily and Zaheer, 1999) that can be dynamic (Teece and Pisano, 2004; Peteraf et al., 2013). However, so far literature at the intersection of strategic management and internationalization has not clarified to what extent firms' resources and capabilities contribute to develop a competitive advantage based on a digital export strategy. Indeed, current literature has almost prevalently described the benefits associated to digital exports (e.g., Martens, 2013; Pezderka and Sinkovics, 2011) and the related costs (e.g., Giuffrida et al., 2019; Sinkovics et al., 2007), virtually no study has leveraged an RBV perspective and examined how the quantity and quality of resources can make a difference for digital export. The international business literature, after an initial

tentative to understand the implications of e-commerce for cross-border investments (see, for instance, de la Torre, J., and Moxon, R., 2001 and Zaheer and Manrakhan, 2001), has started only lately to rekindle attention on digital export within the ongoing debate on the relationship between firms' internationalization and information and communication technologies (e.g. Alcacer et al., 2016). Also this literature has stressed the strategic role of resources by showing that, although e-commerce has created new international business opportunities, several firms (and SMEs in particular) still suffer from the lack of relevant resources that might challenge their ability to leverage digital export (Schu et al., 2016). In addition, a very recent research note by Tolstoy et al. (2020) has offered some preliminary insights on the strategic role of capabilities - in addition to resources - in fostering the process of international e-commerce development, by adopting an international entrepreneurship perspective. Nevertheless, this study focuses on retail SMEs and does not provide any strong empirical evidence yet, which explains why the authors themselves open their article by highlighting the urgent need to investigate how firms (and SMEs in particular) can pursue new opportunities in a digital international business environment and conclude by inviting future researchers "to look into how the processes of e-commerce internationalization are conditioned by company-specific and market-specific circumstances" (Tolstoy et al., 2020, p.11). The scanty theoretical and empirical evidence on the antecedents of digital export is very surprising, as both scholarly research and industry reports indicate that firm's resources in the guise of technology, data, organizational capabilities (Davenport & Redman, 2020), skills (Tolstoy et al., 2020,,) and other intangible and human resources (Verhoef et al., 2019) are of paramount importance to guide digital transformation in business (Deloitte, 2018).

In light of this knowledge gap, and building on the RBV theory of the firm (Barney, 1991; Peteraf, 1994) and on the notion of digital capabilities within digital transformation (Gurbaxani and Dunkle, 2019), the main objective of this study is to examine the effect of

firms' resources - in terms of both quantity (i.e. the size of the firm) and quality (under the guise of digital technologies) - and of firms' capabilities - in the form of managerial skills - on the ability to set-up a digital export strategy. Therefore, we address the following inter-related research questions: 1) to what extent do the quantity and quality of firm resources influence digital export? 2) What type of managerial capabilities play a role for digital export beyond resources? To reach this goal, we rely on a unique dataset covering 102 Italy-based firms of different size (small, medium, and large) active in three different sectors (design & furniture, fashion, food & beverage). Our results provide a three-fold contribution to the research stream aiming at extending the resource-based and capabilities approach to the study of export strategy (Dhanaraj and Beamish, 2003). First, we offer evidence that the amount (i.e., quantity) of firms' resources does not play a significant role to achieve internationalization through digital export. Second, we recognize that digital technologies (Rusmann et al., 2015) are key firm's resources that make a significant difference in fostering a digital export strategy. Third, we shift our attention from traditional to digital capabilities and provide evidence that firms employing an e-commerce manager are more likely to enhance their digital export strategy than firms employing a traditional export manager.

The paper is organized as follows. In the next section a literature review is illustrated. The third section describes the data and methods. Section four portrays the major findings. The fifth section discusses the findings and elucidates the main theoretical contributions and practical implications. The sixth and last section puts forward the concluding remarks, portrays the study's limitations and explores paths for future research.

2.Literature Review

2.1 The Resource Based View of the firm and firms' capabilities in the digital age

Digital Resources

Combining studies rooted in neo-classical economics (e.g., Ricardo, 1817), anti-trust theory (e.g., Demsetz, 1973), evolutionary economics (Nelson & Winter, 1982), firm resource heterogeneity (Rumelt, 1984; Penrose, 1958; Wernerfelt, 1984) and positioning his work in structure-conduct-performance (SCP) work (Porter, 1980), Barney (1991) laid the foundations of the Resource-Based View (RBV) theory of the firm at the beginning of Nineties. The theory explains how firms' value and profit are generated based on firms' resources to be conceived as "all assets, capabilities, organizational processes, firms attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (Barney, 1991: p. 101). More specifically, to be able to create value and profits, firms need to access resources that are a) *valuable* in that they are able either to neutralize threats or exploit opportunities; b) *rare* because a fraction of the current and prospective competitors can access them; c) *inimitable* or, more realistically, non-perfectly imitable by competitors; d) *non-substitutable* in the sense that there cannot exist strategically equivalent substitutes that "are valuable but neither rare or imperfectly imitable" (Barney, 1991: p. 106).

Interestingly, in his original contribution on the Resource Based View (RBV) of the firm, Barney observed that "computers or other types of machines, are part of the physical technology of a firm and usually can be purchased across markets" (Barney, 1991: p. 114) . He went on commenting that as machines can be purchased by any firm, they are not themselves a source of sustained competitive advantage. However, he further elaborates that when machines and information processing systems are deeply embedded into the formal and informal decision-making process, they might be considered a potential source for sustained competitive advantage.

This is particularly true in today's fast paced and hyper-competitive global business environment (D'Aveni, 1994, 2010), where firms willing to internationalize have to face

mounting levels of uncertainty and complexity and to be fast and responsive in their decision-making process. As such, digital technologies brought about by the ongoing 4th industrial revolution (Rusmann et al., 2015) – also known as Industry 4.0 - are becoming increasingly critical resources for firms to achieve, maintain and develop a sustained competitive advantage vis-à-vis their competitors (Porter, 1980, 1985) in both manufacturing (Kagermann et al., 2013) and service industries (Mariani and Borghi, 2019) within an international competitive arena. While Internet, wireless communication and mobile technologies are rather common for most of the firms willing to internationalize (Pezderka and Sinkovics, 2011), other technologies' role has been less explored. For instance, extant literature has widely discussed the role of big data and analytics to create value (Davenport, 2017) and argued that firms possessing them can achieve a competitive performance advantage by contributing to more satisfying customer journeys and e-commerce experiences (Akter et al., 2016; Wamba et al., 2017; Vakulenko, Shams, Hellstrom and Hjort, 2019). In parallel, cloud computing may not only ease internationalization but also contribute to increase the competitiveness of the firm when the services are deployed by premier suppliers such as Amazon, Cisco, Google, IBM, Microsoft, Oracle and SAP (Hosseini et al., 2019).

Digital Capabilities

Firms' capabilities have been defined as the 'firm's capacity to deploy resources for a desired end result' (Helfat and Lieberman, 2002). Extant theorization around firms' capabilities has defined them as organizational abilities to combine, assemble, integrate, and exploit resources to achieve a competitive advantage (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997). Firms' capabilities are part of the wide set of firms' competitive capabilities defined as "a firm's capacity to deploy resources, usually in combination, using organizational processes, to effect a desired end. They are information-based, tangible or intangible processes

that are firm specific and are developed over time through complex interactions among the firm's resources. They can abstractly be thought of as 'intermediate goods' generated by the firm to provide enhanced productivity of its Resources, as well as strategic flexibility and protection for its final product or service.” (Amit and Schoemaker, 1993: p. 35). These capabilities might be dynamic if they adapt promptly to the changing business environment and are functional to adapt, integrate, and re-configure resources. (Teece and Pisano, 1994). These latter capabilities cannot be purchased as they consist of a) managerial and organizational processes (i.e., routines), b) present position (i.e., endowment of technology and intellectual property, as well as customer base and upstream relations with suppliers), and c) the paths available to it (i.e., strategic alternatives available to the firm and opportunities).

Research in information management and marketing has found that resources by themselves are not always sufficient to generate significant performance gains; rather, they have to be transformed into distinctive capabilities (e.g., Bharadwaj, 2000; Chang et al., 2010; Roberts and Grover, 2012; Melville et al., 2004; Trainor et al., 2014). Taken together, the findings of the aforementioned literature suggest that investment in technological resources is not necessarily conducive to superior performance. Rather, they suggest that technological resources should be combined with other organizational resources that include a human component consisting of technical skills and an intangible component encompassing organizational culture.

Among the human component of firms' capabilities (consisting of technical skills) there are also digital capabilities (Gurbaxani and Dunkle, 2019; Tolstoy et al., 2020), which are defined as the competences by which companies align the features of digital technology with what customer needs and wants (Chaffey et al., 2015) and which are becoming increasingly relevant for successful digital transformation. Based on a survey of senior executives at 147 US companies, Gurbaxani and Dunkle (2019) find that there are six dimensions of digital

transformation, namely: strategic vision, culture of innovation, know-how and intellectual property, digital capability, strategic alignment, technological assets. The latter ones entail the digital technologies underpinning the digital transformation including Internet and wireless communication, mobile technologies, cloud computing, data mining, big data, etc. Interestingly, digital capabilities differ from technological assets and involve: 1) availability of digital expertise; 2) visionary/innovative skills within the company to define the right digital strategy; 3) systems of grading and incentives based on individuals' level of digital transformation knowledge; 4) technical talent for innovation; 5) digital skills to execute the digital strategy. Digital capabilities are therefore firm level capabilities that are inclusive of what has been previously termed as Internet capabilities (Glavas and Mathews, 2014).

In line with the above discussion, in our study we posit that not only digital technologies but also firms' digital capabilities (in the wider meaning of competitive capabilities, be they dynamic or not) are increasingly relevant for firms' performance, with a focus on export. As such, we contribute to extend the resource-based approach to the study of export (Dhanaraj and Beamish, 2003) as we examine the effect of digital resources (under the guise of digital technologies) and digital firms' capabilities (in the form of digital capabilities subsumed in managerial skills, competences and knowledge) on the propensity of manufacturing enterprises to undertake digital export. Accordingly, to our knowledge this work is one of the first attempts to understand the digital export drivers compared to other research focusing on traditional export. In the ensuing section we develop our research hypotheses.

2.2 Hypotheses development

2.2.1 Firm size and Digital Export

The literature on SMEs' internationalization suggests that small companies are more likely to adopt online channels to invest abroad compared to larger companies. Pezderka and

Sinkovics (2011), for instance, argue that digital export allows avoiding the burden of a direct physical investment, thus requiring fewer resources. Beyond the decreased entry costs, additional benefits associated to digital export include the availability of new and faster sales and communication channels, and easier payments (Morgan-Thomas and Jones, 2009; Martens, 2013). Furthermore, relying on technology-enabled exports reduces the distance and cost of contact creation with potential foreign partners, allowing SMEs to benefit from direct access to local expertise (Lecerf and Omrani, 2019). Hence, these studies seem to look at digital export as an easier alternative for SMEs than traditional trade.

Nevertheless, other studies within the international business and entrepreneurship literatures have stressed the challenges that SMEs face in leveraging digital export due to their scarcer resource availability (Schu et al., 2016) and weaker attitude to reconfigure business models that are often family-based (Luo, Zhao, & Du, 2005). In addition, SMEs tend to consider the implementation of digital export expensive, time-consuming and technologically complex (Melen Hånell et al., 2019). Only companies that make initial (risky) investments in relevant resources can create a sufficient “slack” that enable to cope with the foreign on-line market dynamics (Tolstoy et al., 2020).

When considering an RBV perspective, which is the theoretical lens adopted in our study, the size of a company reflects the amount of available resources and capabilities that can be leveraged to build a competitive advantage (Ramon-Jeronimo et al., 2019). Having access to a lower amount of resources generally creates barriers to the development of risky strategies such as internationalization. In this regard, SMEs are known to suffer from resource limitations in many aspects that are key for a digital export strategy, such as logistics assets, financial capacity, and ICT knowledge (Stockdale and Standing, 2006). Indeed, while it is true that some types of costs or investments are avoided with digital export, others stay in place or even increase with respect to offline internationalization, e.g. customs and duty regimes and tax laws

(Bieron and Ahmed, 2012; Polanski, 2002; Teltscher, 2002), marketing and branding issues (Guercini and Runfola, 2015) cultural aspects (Gefen and Heart, 2006), logistics issues (Ramanathan et al., 2014), and uncertainty costs (Giuffrida et al., 2019). All these costs require resources and capabilities to be fully addressed, thus making digital export a less viable option for SMEs.

In fact, selling to online customers involves more than setting up a functioning web site (Sinkovics et al., 2007), as it requires a full set of physical assets (e.g. capital or distribution facilities), which still may pose SMEs at a disadvantage. There are, indeed, many complexities linked to the establishment of a digital export strategy, which combine the difficulties of e-commerce-based transactions with those of international business. More specifically, on the one hand, digital export requires a more articulated distribution network with respect to national digital transactions. Both delivery and after-sale services are, in fact, more difficult to organize, due to longer distances and different habits or expectations of foreign customers, which might increase the probability of returns with respect to national e-commerce customers (Lun, 2017). Conversely, large enterprises not only can rely on more efficient and/or less expensive distribution networks, but also can afford a larger amount of resources to establish a global presence, which can be employed to gain the appropriate knowledge about international markets and to organize the required services to deal with foreign customers (Alon et al., 2019).

On the other hand, offline international trade is typically a B2B process, where the players involved are overseas producers selling bulk products to large-scale retailers through agents or importers; therefore, exporting companies do not have a direct contact with final consumers. Conversely, digital export requires a more direct B2C approach, where the seller has to handle a higher number of fragmented orders. This means that, in order to be effective in reaching the customers and advertising the products, firms need to gain a deep knowledge on how to use the online trade channels and how to design a multi-domestic digital marketing

strategy, which typically SMEs find difficult to develop due to their limited resource availability (Elia, Giuffrida and Piscitello, 2019). In addition, the fragmentation of the demand increases the complexity of managing customs clearance and parcel delivery efficiency, which requires additional resources to be addressed. Finally, although some federal governments are trying to alleviate the impact of such barriers by providing supportive programs, smaller companies often do not meet the size requirements for benefitting from such programs (Gessner and Snodgrass, 2015). This results in a lower chance for SMEs to embrace the opportunities of digital export.

Hence, despite some evidence of IT and e-commerce positive impact on internationalization (Lecerf and Omrani, 2019), relying on an RBV perspective, which emphasizes the centrality of resources to develop strategies that allow reaching superior performance, we claim that large enterprises would face less difficulties than small ones in developing a digital export strategy for their international growth. Therefore, we formulate our first hypothesis:

H₁: The larger the size of an enterprise, the higher its propensity to undertake digital export

2.2.2 Digital technologies as resources driving Digital Export

The emergence and consolidation of Information and Communication Technologies (ICTs) in the last decades has enabled firms to reduce transactions costs, e.g. those linked to transportation, communication, and coordination (Alcacer et al., 2016). These benefits have led companies to increasingly adopt ICTs in their internationalisation processes (Chen and Kamal, 2016) across a number of different industries and stakeholders (Baourakis et al., 2012; Benmamoun et al., 2019). Nonetheless, adopting technologies also brings an increased need of investments. Especially for complex types of ICTs, high sunk costs and additional costs of coordination among adopting firm units often are needed (McElheran, 2015; Chen and Kamal,

2016). While the net effect of technology adoption is difficult to estimate *ex-ante* and may depend on several contextual factors, it is a fact that digital technologies are becoming increasingly widespread. A recent research has shown that many companies that engage with exporting activities, also make use of digital technologies in support of critical areas for their internationalization strategy, such as new product development, marketing and communication, and cross border logistics (Digital Export Observatory, 2020). The adoption of digital technologies represents one of the most significant international business developments of the past few years. Nonetheless, only a limited portion of academic studies investigates the role of digital innovation in companies' internationalization processes (Watson et al., 2018; Gnizy, 2019). On the one hand, similarly to ICTs, digital technologies (e.g. Internet of Things, Additive manufacturing, Blockchain) have an important role in facilitating the management of both domestic and foreign operations. The coordination and integration of the value chain is more effective thanks to blockchain and internet of things, while additive manufacturing allows to reach higher productivity, thus leading to better performances and higher international competitiveness (Nassimbeni, 2001; Van Beveren and Vandebussche, 2010).

On the other hand, beyond the productivity gains brought about by digital technologies, additional benefits arise from the synergies that specific technologies create for the sales and distribution phases when combined with e-commerce. Regarding the former, it is becoming crucial to extract value from the increasing amount and variety of data collected via multiple channels (Colombo and Ferrari 2015; Lee, 2016). The diffusion of online sales channels is progressively shaping the retail industry leading to omnichannel strategies. These aim to provide a seamless experience to customers shopping via all available channels, such as physical channels, catalogues, online and mobile channels (Lee, 2016; Vakulenko, Shams, Hellstrom and Hjort, 2019). The diversification of channels and data sources makes data

aggregation more challenging, therefore big data mining is needed to perform market analysis which can help firms predict customer purchase, suggest ideas for cross-selling and design marketing strategies. This is especially relevant in an internationalisation context, where the diversity of data is also linked to the multiple geographies involved. Searching for new markets becomes easier thanks to the combination of artificial intelligence and big data, while communication capabilities are boosted through the adoption of digital marketing techniques that allow to tailor as much as possible both the product and the message offered to the potential customers.

The multiplication of channels for the retailing industry has also brought significant challenges in the logistics domain. In this regard, the adoption of smart logistics solutions, innovative delivery options like parcel lockers, reception boxes and pick-up points (Mangiaracina et al., 2019), can lead to increased efficiency and better service to customers and seamless and transparent processes from the point of purchase to the time of delivery (Nguyen, de Leeuw, & Dullaert, 2018), fostering e-commerce success both within and across borders. Internet of Things applications allowing to track vehicles, monitor inventory and warehouse robotics can also boost logistics performances and are becoming very widespread among major cross border e-commerce logistics players, like Cainiao, the logistics arm of Alibaba Group (Rimmer and Kam, 2018).

Finally, many studies argue that for a successful digital transformation, companies need a supportive digital culture which is eventually nurtured when digital technologies are well integrated into business operations. If a virtuous cycle is created between technology adoption, technology integration and the development of a digital culture, it will become easier to extend digital practices to different business functions, including the export department (Cassetta et al., 2020). In line with these arguments, we formulate the following hypothesis:

H₂: Enterprises adopting digital technologies have a higher propensity to undertake digital export.

2.2.3 Human capital and Digital Capabilities as Digital Export drivers

People possess knowledge, skills, competences, education, and experience that have been defined as human capital (Becker, 1962) which is a critical firm's resource to create value. For instance, workers' human capital (HC) can enhance productivity, adding both tangible and intangible value to the firm (Hitt, 2001). Consequently, the decision to recruit from the market or develop internally HC (Hatch & Dyer, 2004) is based on a comparative assessment of the expected returns of workers' productivity (Becker, 1964). However, firms do not own their human capital, because it is embodied in their workers/employees, who are free to move from one firm to another (Becker, 1964; Hatch & Dyer, 2004). Accordingly, it is increasingly relevant for firms to attract, acquire and retain talented workers as they can be conducive to economic value for an organization (Snell & Dean, 1992) and can translate into competitive advantage.

International business studies have recognized and examined the role of human capital on internationalization activities and related performance (Daily et al., 2000; Hennart, 2007; Sapienza et al., 2006; Vermeulen and Barkema, 2002). While Hennart (2007) has emphasized the importance of managers' HC for internationalization activities, Vermeulen and Barkema (2002) have found the features of senior management to moderate the performance of a firm during its internationalization and Wen-Tsung et al. (2013) have revealed that employee education and training contribute to accelerate internationalization processes. Overall, it appears that there is an inverted U-shaped relationship between investment in employees' HC and degree of internationalization and that alignment should be found between a firm's

internationalization strategy and its investment in HC (Gomez-Mejia, 1988; Onkelinx et al., 2016).

Traditionally, the key professional figure involved in international activities has been the export manager who is in charge of 1) analysing the firm's propensity to go international, while identifying its potential positioning on the international market, and defining the internationalization objectives and programs; 2) developing a number of actions by product, market, distribution channel, including communication plans; 3) reporting on the progress achieved on the different actions in view of consolidating the company's presence in foreign markets.

However, the emergence and consolidation of digital technologies has brought about new opportunities and challenges for professionals dealing with firms' internationalization. In a study of Chief Digital Officers from various sectors, Tumbas et al. (2017) have found that organizations tend to increasingly hire digital experts to foster one of these three domains: 1) digital innovation; 2) data analytics and 3) customer engagement. Firms increasingly need to develop, indeed, "digital business capabilities", i.e. the ability to integrate marketing skills and digital technologies in order to satisfy customers' needs in the digital sphere, with the final purpose of acquiring and retaining foreign markets' customers that can prompt online sales through digital export (Tolstoy et al., 2020). In particular, big data analytics capabilities have been found to positively influence the degree of internationalization when combined with big data analytics infrastructure (e.g., Bertello et al., 2020).

Digital skill gaps for international managers have become salient over the last two decades due to the proliferation of digital media and e-commerce platforms, the fragmentation of market segments, and the increasing number of online channels (Day, 2011), which have translated into a multitude of (online) consumer behaviors and touch points, convergence of industries, and spread of microsegments (Hagel et al., 2009). Simultaneously, the huge amount

of digital data generated by online customers is empowering companies willing to harness market intelligence by means of data analytics to increasingly recruit employees with skills in digital marketing and analytics, and able to deliver outstanding online customer experience (Tumbas et al., 2017).

In many manufacturing companies interested in internationalizing, this state of affairs had led to a hiring spree of professionals in digital marketing, namely e-commerce managers with specific knowledge and skills in digital marketing techniques such as social media marketing, SEO, SEM, digital advertising, mobile marketing and digital analytics. These professionals have the objective of creating customer intimacy and enhance customer engagement by leveraging data analytics to create a consistent customer experience across digital and non-digital channels (Tumbas et al., 2017). Moreover, they can improve the firm's capability to adopt e-commerce solutions (Ajmal and Yasin, 2012; Mathews et al., 2012).

As e-commerce managers are trained to look at multi- and omni-channel marketing (Giuffrida et al., 2019), they have a better and more comprehensive view of what the customers' needs are and can adapt more easily and nimbly to changes in both the online and offline context compared to export managers that mainly adopt traditional and offline channels. Moreover, the digital skills and experience of an e-commerce manager cannot be easily transferred to an export manager as it requires learning to develop digital marketing skills. Additionally, e-commerce managers need to 1) be able to integrate strategic knowledge with existing 'traditional' marketing and communication approaches, while also having a working overview of digital technology; 2) possess specific knowledge of digital technologies as part of their skillset; 3) be able to measure and track online marketing activities: all of these are unique and distinctive skills of a digital marketing expert (Royle and Laing, 2014) such as the e-commerce manager and not certainly part of the traditional export managers skillset. For this reason, the skills of an e-commerce manager in a digital environment are valuable, unique,

non- replicable, and not easily imitable, making the e-commerce manager an irreplaceable human resource for a firm, whose coordination with other digital technologies and digital experts generates a distinctive *digital capability* for the firm enabling better export. Accordingly, we hypothesize that:

H₃: Enterprises employing an e-commerce manager (i.e., possessing digital capabilities) have a higher propensity to undertake digital exports than firms employing a traditional export manager (i.e., not endowed with digital capabilities).

3. Research Data and Methods

3.1 Data

The data used in this research was collected through an online survey targeted at Italian companies operating in the main B2C industries, i.e. fashion, food and beverage, and furniture. We selected these industries as they are representative of the traditional “Made in Italy” activities, as they accounted for about 90 out of 163 billion of euros of the Italian export of consumer goods in the year 2019 (ISTAT, 2020). Defining the population for this study was not an easy task. Indeed, no official statistics about companies implementing digital export strategies are available. To identify suitable subjects for our survey, we contacted professionals through LinkedIn, a business-oriented social network available worldwide since 2003, which counted 630 million members as of June 2019. The use of this platform offered several advantages: 1) direct access to the respondent profile and contacts; 2) opportunity to build a more informal relationship with the initial sample of targeted managers, thus facilitating information sharing and increasing the response rate; 3) possibility to target the most adequate profiles and filter by specific industries, company sizes and countries. Overall, we focused our research on professionals working in export or e-commerce-related positions as these types of respondents are more likely to be the most appropriate sources of information regarding digital

export decisions, thus reducing random and bias errors (Forza, 2002). Over 800 profiles were found matching our keywords in the job title filter section (“digital export”, “cross border e-commerce”, “e-commerce”, “online sales”, “international sales”, “global e-commerce” and similar others). This represents our population. We first prepared a pilot version addressed to 10 practitioners and 3 professors, external to the research group, to test the survey’s clarity and validate the used measures. Following some wording adjustments to remove any possible ambiguity or misunderstandings, the final version was distributed and stayed active online for five months. Afterwards, we contacted and sent the survey, upon acceptance to participate in this research, to 426 companies, that represent our theoretical sample. As an incentive to participate in the study, the respondents could receive 1) the overall results of the research with descriptive statistics and 2) a personalised elaboration of their answers in comparison with the average responses given by other participants in the same industry or with similar company size, in order to understand their positioning against competitors. The survey was administered via the online tool Opinio between June and October 2019. We received 174 answers (41% response rate). Not all the answers were however usable. After checking for mistakes (e.g. double submissions or logical inconsistencies) and clearing incomplete answers, a total of 138 valid questionnaires were finally available for the analysis. Moreover, to prevent any possible non-response bias, a subset of non-respondents was analysed, as per Goode and Stevens (2000), Evangelista et al. (2012), and similar studies. Their demographic characteristics, such as type of activity and age of the company, did not significantly differ from the respondent sample. Then, in order to check for response bias, we compared answers submitted at an early stage with later ones, finding no significant differences as well as suggested by Lambert and Harrington (1990). As a final step, we integrated the data collected through our survey with financial information obtained from Orbis (Bureau van Dijk). After matching the two databases, we were able to work on a final dataset composed of 102 Italian firms due to some

missing values in Orbis. We checked for the representativeness of our sample with respect to the national data (source: database “I.stat”, Italian National Institute of Statistics), by comparing the percentage of firms engaged in digital export for each industry and for three different size categories (small, medium and large firms)². The Chi-Square test cannot reject the null hypothesis of representativeness of our sample for any of the categories considered, with the exception of the fashion and apparel industry, where the number of firms involved in digital export is slightly underrepresented in our sample.

3.2 Variables

Dependent variable

Our dependent variable is *Digital Export*, a dummy taking value of 1 if the company makes a systematic and strategic use of e-commerce to sell its products abroad and 0 in case it does not use (or use only occasionally) e-commerce for export. More specifically, we assigned the value equal to 1 if the company, answering question “Select the option that better describes the channel strategy used to export”, selected either “My company mainly uses online channels to export” or “My company uses a multichannel strategy (online and offline) to export”, while we assigned the value equal to 0 if the company answered “My company mainly uses offline channels to export”. In our sample, 56 companies (i.e. 54.90% of sample) were assigned the value 1, while the remaining 46 (i.e. 45.10% of the sample) were assigned the value 0.

Explanatory Variables

The first explanatory variable is *Assets Size*, corresponding to the total assets of each firm in the year 2017 (source: Orbis)³. This variable is able to account not only for the dimension of

² Data about digital export of micro-firms (i.e. less than 10 employees) were not available for the national sample.

³ We employed 2017 as this was the last year for which financial data were available in Orbis when we collected the data.

the firm, but also and above all for the total amount of resources owned by the firm, thus being in line with our RBV approach. Our data show that the average value of total asset for firms undertaking digital export is lower than the value of total asset of firm not undertaking digital export (€ 330,611 vs. 2,635,460 € respectively)⁴, which seems to be against our first hypothesis.

The second explanatory variable is *Digital Technologies*, taking value of 1 if the company makes use of Industry 4.0 technologies such as Smart Logistics, Blockchain, Big Data and Artificial Intelligence, and 0 otherwise. The number of firms using at least one of these new technologies is equal to 46 (corresponding to 45.10% of the sample), while the remaining 56 (corresponding to 54.90% of the sample) did not select any of these technologies.

The third couple of explanatory variables refers to the human resources, and in particular to the presence of an export and/or of an e-commerce manager in the company. We employed two dummies, i.e. *Export Manager* and *E-Commerce Manager*, accounting for the type of figure that is present in the company. The information comes from the survey questions “Which of the following roles does your company have?”, being the available options “No export and e-commerce manager”, “Export manager”, “E-commerce manager”, “Export and e-commerce manager”. In our sample, 35 companies have both an export and an e-commerce manager (meaning that both dummies takes value of 1); conversely, 50 firms have only an export manager while 10 firms only an e-commerce manager; the remaining 7 companies have neither an export nor an e-commerce manager. The total number of firms having an export manager is, hence, equal to 85 (i.e. 83.33% of the sample), while the total number of firms having an e-commerce manager is equal to 45 firm (i.e. 44.12% of the sample).

⁴ Given the large values reflecting the total assets of the firms, the variable has been standardized in order to smooth the scale.

Control variables

Among the control variables, we employed *Firm's Age*, which is computed as the difference between the year 2019 and the year of incorporation the firm (source: Orbis, Bureau van Dijk). We expect the older firms to have a higher probability to undertake a digital export strategy due to their experience and to the availability to accumulate the resources that are needed to support an internationalization strategy. A second control variable is *Firm's Productivity*, which is computed as the ratio between the turnover and the total assets of the firm in the year 2017 (source: Orbis, Bureau van Dijk). As suggested by the traditional international business theories (e.g. Dunning and Lundan, 2008), we expect the most productive firms to have a higher propensity to internationalize (and, hence, to undertake also digital export) in order to exploit their competitive advantage. A third control that we employ is *Joint Stock Company*, a dummy taking value of 1 if the company is organized as an incorporated association of two or more shareholders having a separate legal existence (source: Orbis, Bureau van Dijk). These companies can typically rely on a higher possibility to attract investors and raise capital to support strategic decisions such as internationalization, including digital export. Hence, we expect a positive correlation with our dependent variable. Finally, to control for the idiosyncratic characteristics of the industries in which each firm operate, we employed three dummy variables, i.e. Food & Beverage, Fashion & Apparel, and Furniture, being the latter the base case. In our sample, the firms operating in each of these industries are 36 (i.e. 35.29% of the sample), 44 (i.e. 43.14% of the sample) and 22 (i.e. 21.57% of the sample), respectively. Table 1 summarizes the list of the variables, the proxies and the main statistics of the variables.

- Insert Table 1 about here -

3.3 Methodology

Having our dependent variable a dichotomous nature, we employed a robust Probit model to test our hypotheses. Table 2 illustrates the correlation matrix, the mean values, the standard deviations, the minimum and the maximum values of our dependent and explanatory variables. Given that some correlations are above 0.50, we computed the Variance Inflation Factors: all values are below the traditional threshold of 10.00, thus ruling out potential multicollinearity problems.

- Insert Table 2 about here -

4. Findings

Table 3 displays the results of the regression analysis, reporting the coefficients and marginal effects in columns 1 and 2, respectively. The variable *Assets Size* displays a negative and not significant coefficient and marginal effect, meaning that hypothesis 1 is not supported.

Regarding the second hypothesis, the variable *Digital Technologies* turns out to be positively and significantly ($p < 0.01$) correlated with the dependent variable, both in the coefficient and in the marginal effect. The latter reveals that firms having digital technologies increase the probability to adopt digital export of about 21.1% respect to firms not having any digital technology. Thus, hypothesis 2 is fully supported.

As far as hypothesis 3 is concerned, the variable *Export Manager* displays a negative but not significant coefficient and marginal effect, showing that firms that have an export manager do not have a higher propensity to undertake digital export. Conversely, the variable *E-Commerce Manager* exhibits a positive and significant ($p < 0.01$) coefficient and marginal effect, being the latter equal to 0.428, meaning that firms with an e-commerce manager have a higher probability of adopting a digital export strategy of about 42.8%. Accordingly, hypothesis 3 is fully supported.

As regards the control variables, the dummy *Food & Beverage* exhibit a negative and significant ($p < 0.10$) coefficient, thus showing that firms operating in this sector are less likely to undertake a digital export strategy.

Robustness checks

In order to check the robustness of our results, we introduced an alternative measure of size, i.e. *Employees Size*, which is a scale value ranging from 1 to 4, being the lowest associated to micro-firms (1-10 employees), followed by small firms (11-50), medium firms (51-250) and large firms (above 250). The number of firms belonging to each category are 8 (7.84%), 13 (12.75%), 45 (44.12%) and 36 (35.29%), respectively, meaning that most of the firms (i.e. 66, equal to 64.71% of the sample) are SMEs with less than 250 employees. This variable not only represents an alternative measure of size, but also allows to capture another type of resources that companies can leverage besides the total assets, i.e. the human capital. Results, which are displayed in columns 3 and 4 (coefficients and marginal effects) of table 3, show a positive but not significant coefficient. Hence, hypothesis 1 is not supported even when using an alternative measure of size; conversely, hypotheses 2 and 3 are fully confirmed.

We also employed a more fine-grained variable for digital technologies, named *Digital Technology Intensity*, which accounts for the number of different technologies adopted by each firm. Among the firms having digital technologies, the majority can count on either one or two technologies (22 and 15 firms, respectively), while only 8 firms have more than two technologies (i.e. from 3 to 5). Results, which are displayed in columns 5 and 6 of table 3, confirm the strong positive effect of this intensity variable ($p < 0.05$ for the coefficient and $p < 0.01$ for the marginal effect), thus showing that firms have a higher probability to engage in digital export when adopting and combining more than one digital technology.

- Insert Table 3 about here -

5. Discussion

The key findings of this study are threefold. First, size does not matter in digital export, i.e. SMEs do not suffer from a weaker propensity to engage with digital export despite resources constraints. This finding seems to contradict some of the most recent previous international business research that has stressed the higher challenges that SMEs face when engaging in digital export due to their limited resource availability and lower flexibility in business model adaptation (e.g. Schu et al., 2016, Melen Hånell et al., 2019).

Our results are, however, more in line with the recent findings from Tolstoy et al., (2020), who suggest that a digital export strategy requires some initial investments in “relevant” resources – by mentioning explicitly digital technologies as an example - and in digital business capabilities – arising from the integration of marketing capabilities in digital technologies - to be effective. Indeed, our study shows that what matters is not the quantity but rather they the quality of resources and capabilities. More specifically, we provide evidence that, on the one hand, firms leveraging digital technologies are more likely to enhance their digital export. This second key finding seems to extend other literature that found that the investment in digital technologies such as big data influences positively the degree of internationalization (e.g., Bertello et al., 2020).

On the other hand, we show that digital capabilities are critical for export as firms employing an e-commerce manager are more likely to enhance their digital export than firms employing only a traditional export manager. This third key finding is rather novel in the internationalization literature and reinforces the ideas that digital skills are paramount to ride the digital transformation wave (Tolstoy et al., (2020)). Theoretical and practical implications are discussed in the following two subsections.

5.1 Theoretical implications

We make several theoretical contributions. First, in the context of firms willing to internationalize, while IT was recognized as a relevant resource in the very seminal work of the RBV (Barney, 1991), we find that the right combination of digital resources (i.e., digital technologies) and digital capabilities (i.e., presence of an e-commerce manager) can make a difference for firms in gaining a competitive advantage in terms of digital export. Accordingly, this is the first study combining the RBV and firms' capabilities to explain that to achieve an effective "digital transformation" under the guise of adoption of digital export, firms both need digital resources and digital capabilities, with the latter ones subsuming mere Internet capabilities identified in previous internationalization studies (Glavas and Mathews, 2014; Trainor et al., 2014). Second, and related to the previous point, we show that digital resources (i.e., digital technologies) need to be integrated with digital capabilities to foster a firm-level "digital competitive advantage" which we propose as an extension of the examined competitive advantage enabled by IT technologies (Pavlou and El Sawy, 2010). Third, we also find that the amount of resources has a not significant impact, meaning that it is the *quality* rather than the *quantity* of resources that affects the propensity to digital export, together with the digital capabilities. In other words, it is the heterogeneity across firms in terms of digital capabilities (as a result of the human capital) that can help organizations that possess those valuable, rare, imperfectly imitable and non-substitutable digital technologies (Barney, 1991; 2001) to achieve high levels of digital export (Sivathanu, 2019; Priem & Butler, 2001). Our additional evidence shows that the adoption of a digital export strategy is even more likely when firms have more than one digital technology, as they contribute to create digital synergies and complementarities and to form a digital corporate culture.

Fourth, we contribute to international business theory by shedding new light on digital internationalization (Alcacer et al., 2016) and suggesting that firms must possess an ownership advantage founded on both digital resources and digital capabilities to export in foreign market using e-commerce. In other words, being export the first step of internationalization for several firms (Johanson and Vahlne, 2008), our results seem to suggest that firms can better manage the “liability of foreignness” arising from a digital export strategy by reducing their “liability of digitalness” through the development and combination of digital resources and capabilities. Fifth, we contribute to the international entrepreneurship literature by answering the “urgent” call launched by Tolstoy et al. (2020) to investigate how firms (and SMEs in particular) can pursue new opportunities in a digital international business environment, by showing the strategic role of digital technologies and digital capabilities.

Sixth, we also enrich the work of Barua et al. (2004), who introduce the construct of online information capabilities, suggesting that today’s firms willing to go international, need to build on digital capabilities (Gurbaxani and Dunkle, 2019). Digital transformation is, indeed, defined as the “reinvention of a company’s vision and strategy, organizational structure, processes, capabilities, and culture to match the evolving digital business context” (Gurbaxani and Dunkle, 2019). The digital transformation has changed the way companies internationalize themselves but also redefined the markets and industries as customers and suppliers have undergone a digital transformation themselves and global value chains are now digitized. Finally, we contribute to the ongoing debate of closing the marketing capability gap (Day, 2011) with an emphasis on the relevance of identifying skill gaps for export managers. In particular, we introduce the concept of “digital export capabilities” that can be described as the digital capabilities subsumed in managerial skills, competences and knowledge that are embodied in the e-commerce manager professional and contribute to make a difference for digital export.

5.2 Practical implication

In terms of managerial implications, the results of the study suggest that firms should invest in both the adoption of digital technologies and in the development of digital skills if they aim at developing a competitive advantage based on digital export. Businesses today already live in a world that is increasingly digital and interconnected on a global scale. Despite the investments needed to cope with this digitalization trends are highly demanding, there is ample evidence that many benefits can outweigh the initial costs. Indeed, on the one hand, digital technologies not only can be strictly functional to implement digital export, but they can also offer an indirect contribution by increasing the productivity of the upstream (e.g. production) and downstream (e.g. distribution and after-sales services) value-chain activities surrounding the online sale. In addition, digital technologies contribute to the creation of a “digital culture”, which prompts the firm to upgrade also the corporate strategies, e.g. by moving from traditional to digital export. This is consistent with prior literature that has found that Internet capabilities can trigger better export marketing capabilities in the guise of processes for gathering and gaining insights from market export information and decisions about customer services, distribution, communication and selling (Trainor et al., 2014). On the other hand, firms should try to develop digital skills both to manage more efficiently such digital technologies and to implement more effectively a digital export strategy. This objective can be pursued either by hiring an e-commerce manager or by training the export manager on digital knowledge (e.g. online marketing, digital payments, smart logistics, legal regulations for e-commerce etc.), in order upgrade his/her skills and to turn him/her into a “digital export manager”.

The urge to shift towards digital capabilities and technologies to be more competitive internationally has been made particularly relevant recently, also in the light of the COVID-19 pandemic emergency. This crisis has demonstrated how complicated ensuring continuity of

operations can be, especially on a global scale, when companies are not equipped with the right set of skills and resources. The world is becoming increasingly complex and uncertain; disruptive events are not to be considered rare occurrences or black swans, as their likelihood is predicted to increase. All these contingencies should push companies to set the digital transformation at the top of their strategic priorities for conducting international business successfully. As this study confirms, this holds for all type of companies, regardless of their size or amount of resources.

5.3 Limitations and Areas of Future Research

This work is not without limitations, which, however, represent interesting opportunities for future research. First, our study focuses on firms that are already involved in export activities; future studies could expand the analysis to understand the role of digital technologies and capabilities in fostering the propensity to internationalize either through (digital) export or through other alternative types of internationalizations, ranging from offshoring outsourcing to M&As. Future studies should also try to better disentangle the performance effects associated to digital export, e.g. by exploring the percentage of revenues generated by this activity. A more fine-grained analysis on the role of the different types of technologies in fostering digital export is also desirable, together with a deeper analysis on the effects arising from the heterogeneity of the firms (besides their size) and of individuals (by considering other capabilities). In addition, while we focused on the impact of individuals for manufacturing companies, future research should establish to what extent the firm's digital capabilities are dependent on individuals' or managerial teams' digital capabilities and if these capabilities are portable or replicable (Barney, 1991; 2001) and to what extent they might represent a driver of sustained competitive advantage. Overall, future studies might re-conceptualize within digital

settings both the RBV and firm's capabilities to explain the digital transformation of enterprises.

Despite these limitations, we believe that our study represents one of the first theoretical contributions - within the RBV and capabilities literature – that discusses and provides evidence of the conjoint role of digital technologies and capabilities in the development of a sustained competitive advantage based on digital export.

6. Conclusions

This study set out to explore the role of firm digital resources – in the guise of both digital technologies and digital capabilities – on digital export performance. Building on the resource-based view (RBV) perspective of the firm and firms’ competitive capabilities, this work found that firm size does not represent a liability for small firms willing to engage with digital export. We also detect that both digital technologies and digital capabilities are conducive to enhanced firms’ digital export.

References

- Ajmal F., & Yasin N. M. (2012). Model for electronic commerce adoption for small and medium sized enterprises. *International Journal of Innovation, Management and Technology*, 3(2): 90.
- Akter, S., Wamba, S. F., Gunasekaran, A., Dubey, R., & Childe, S. J. (2016). How to improve firm performance using big data analytics capability and business strategy alignment?. *International Journal of Production Economics*, 182, 113-131.
- Alcacer J., Cantwell J., Piscitello L. (2016), “Internationalisation in the information age: a new era for places, firms and international business networks?”, *Journal of International Business Studies*, Vol. 47, pp. 499-512.
- Alon, I., Chen, S., and Mandolfo, M. (2019). Supply chain – marketing integration: How do European SMEs go to China via the New Silk Road, *Business Process Management Journal*, 25(2), 368-378.
- Amit, R. and P. J. Schoemaker (1993). ‘Strategic assets and organizational rent’, *Strategic Management Journal*, 14(1), pp. 33–46.
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Barney, J. (2001). Year Retrospective on the Resource-Based View. *Journal of Management*, 27(2001), 643–650. <https://doi.org/10.1177/014920630102700602>
- Barua A., Konana P., Whinston A., Yin F., (2004), An empirical investigation of net-enabled business value, *MIS Quarterly*, 28 (4), 585–620.
- Becker G. S., (1962), Investment in human capital: a theoretical analysis, *J. Polit. Econ.* 70 (5), 9–49.

- Becker G.S. (1964). *Human Capital*. Columbia University Press, New York.
- Bertello, A., Ferraris, A., Bresciani, S., & De Bernardi, P. (2020). Big data analytics (BDA) and degree of internationalization: the interplay between governance of BDA infrastructure and BDA capabilities. *Journal of Management and Governance*, 1-21
- Bharadwaj, A. (2011). A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation. *Management Information Systems*, 24(1), 169–196.
- Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Quarterly*, 24(1), 169–196
- Bieron, B., and Ahmed, U. (2012), Regulating E-commerce through international policy: Understanding the international trade law issues of E-commerce, *Journal of World Trade*, 46(3), 545-570.
- Baourakis, G., Kourgiantakis, M., & Migdalas, A. (2002). The impact of e-commerce on agro-food marketing. *British Food Journal*, 104(8), 580-590.
- Benmamoun, M., Singh, N., Lehnert, K., & Lee, S. B. (2019). Internationalization of e-commerce corporations (ECCs). *Multinational Business Review*, Vol. 27 No. 4, pp. 317-338.
- Cassetta, E., Monarca, U., Dileo, I., Di Berardino, C., and Pini, M. (2020), The relationship between digital technologies and internationalisation. Evidence from Italian SMEs, *Industry and Innovation*, 27(4), 311-339.
- Chaffey, D., Hemphill, T., & Edmundson-Bird, D. (2015). *Digital business and e-commerce management*. UK: Pearson.
- Chang, W., Park, J. E., & Chaib, S. (2010). How does CRM technology transform into organizational performance? A mediating role of marketing capability. *Journal of Business Research*, 63(8), 849–855
- Chen, W., and Kamal, F. (2016). The impact of information and communication technology adoption on multinational firm boundary decisions, *J Int Bus Stud*, 47, 563–576.
- Colombo, P., and Ferrari, E. (2015). Privacy Aware Access Control for Big Data: A Research Roadmap, *Big Data Research*, 2 (4), 145–154.
- D'Aveni, R. A., Dagnino, G. B., & Smith, K. G. (2010). The age of temporary advantage. *Strategic management journal*, 31(13), 1371-1385.
- D'Aveni, R.A. (1994). *Hypercompetition Managing the Dynamics of Strategic Maneuvering*. Free Press, New York.
- Daily C., Certo T., Dalton D., (2000), International experience in the executive suite: The path to prosperity? *Strategic Management Journal*, 21(4): 515–523.
- Davenport, T.H., & Redman, T.C., (2020). Digital Transformation Comes Down to Talent in 4 Key Areas, *Harvard Business Review*, retrieved 22.01.2021 at <https://hbr.org/2020/05/digital-transformation-comes-down-to-talent-in-4-key-areas>

- Davenport, T.H. (2017). How analytics have changed in the last 10 years, *Harvard Business Review*, June 2017.
- Day G.S. (2011). Closing the marketing capabilities gap, *Journal of Marketing*, Vol. 75 July 2011), 183–195.
- de la Torre, J., and Moxon, R. (2001), “E-commerce and global business: The impact of the information and communication technology revolution on the conduct of international business”. *Journal of International Business Studies*, Vo., 32, No. 4, pp. 617–639
- Deloitte (2018). What key competencies are needed in the digital age?, Retrieved 21.01.2021 at: <https://www2.deloitte.com/content/dam/Deloitte/ch/Documents/innovation/ch-en-innovation-automation-competencies.pdf>.
- Dhanaraj C., Beamish P.W., (2003), A resource-based approach to the study of export performance, *J. Small Bus. Manag.* 41 (3), 242–261.
- Digital Export Observatory (2020), Export digitale: è tempo di innovare!, research report, School of Management of Politecnico di Milano, Milan, March 2020
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10–11), 1105–1121.
- Elia, S., Giuffrida, M., and Piscitello, L. (2019). Does e-commerce facilitate or complicate SMEs’ internationalisation?, *ICE, Revista de Economía*, 909, 61-73.
- Evangelista, P., Mogre, R., Perego, A., Raspagliesi, A., and Sweeney, E. (2012). "A survey-based analysis of IT adoption and 3PLs' performance", *Supply Chain Management: An International Journal*, 17 (2), 172-186.
- Forza C., (2002), Survey research in operations management: a process-based perspective, *International Journal of Operations & Production Management*, 22(2), 152–194.
- Fosso Wamba, S., Gunasekaran, A., Akter, S., Ren, S. J. F., Dubey, R., Childe, S. J. (2017). Big data analytics and firm performance: Effects of dynamic capabilities. *Journal of Business Research*, 70, 356–365.
- Gefen, D., and Heart, T. (2006), On the need to include national culture as a central issue in e-commerce trust beliefs, *Journal of Global Information Management*, 14(4), 1-29.
- Gessner, G. H., & Snodgrass, C. R. (2015). Designing e-commerce cross-border distribution networks for small and medium-size enterprises incorporating Canadian and US trade incentive programs. *Research in Transportation Business & Management*, 16, 84-94.
- Ghobadian A., Talavera I., Bhattacharya A., Kumar V., Garza-Reyes J.A., O'Regan N. (2020) Examining legitimatisation of additive manufacturing in the interplay between innovation, lean manufacturing and sustainability, *International Journal of Production Economics*, 209, 457-468.
- Giuffrida M., Mangiaracina R., Perego A., Tumino A., (2019), Cross-border B2C e-commerce

- to China: An evaluation of different logistics solutions under uncertainty, *International Journal of Physical Distribution & Logistics Management*, 50 (3), 355-378.
- Glavas C., & Mathews S. (2014). How international entrepreneurship characteristics influence Internet capabilities for the international business processes of the firm. *International Business Review*, 23(1): 228-245.
- Gomez-Mejia L. R., (1988), The role of human resource strategy in export performance: A longitudinal study, *Strategic Management Journal*, 9(5), 493-505.
- Gnizy, I. (2019). Big data and its strategic path to value in international firms. *International Marketing Review*. Goode, S. and Stevens, K. 2000. "An analysis of the business characteristics of adopters and non-adopters of WWW", *Technology Information and Management*, 1(1), 129-54.
- Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California Management Review*, 33(3), 114–135. Gregory, G. D., Ngo, L. V., & Karavdic, M. (2019). Developing e-commerce marketing capabilities and efficiencies for enhanced performance in business-to-business export ventures. *Industrial Marketing Management*, 78, 146-157.
- Guercini, S., and Runfola, A. (2015). Internationalisation through ECommerce. The Case of MultiBrand Luxury Retailers in the Fashion Industry, in Barbara Stöttinger , Bodo B. Schlegelmilch , Shaoming Zou (Ed.), *International Marketing in the Fast Changing World, Advances in International Marketing*, 26, Emerald Group Publishing Limited, 15 – 31.
- Gurbaxani V., Dunkle D. (2019). Gearing up for successful digital transformation. *MIS Quarterly Executive*, 18 (3), 209-220.
- Hagel, John III, John Seely Brown, and Lang Davison (2009), "The Big Shift: Measuring the Forces of Change," *Harvard Business Review*, 87 (July/August), 41–50.
- Helfat, C. E., and M. Lieberman. 2002. "The Birth of Capabilities: Market Entry and the Importance of Pre-History." *Industrial and Corporate Change* 11 (4): 725–760.
- Hennart, J. F. (2014). The accidental internationalists: a theory of born globals. *Entrepreneurship Theory and Practice*, 38(1), 117-135.
- Hennart J. F., (2007), The theoretical rationale for a multinationality/performance relationship, *Management International Review*, 47(3): 423–452
- Hitt MA, Bierman L, Shimizu K and Kochhar R (2001) Direct and moderating effect of human capital on strategy and performance in professional firms: a resource-based perspective. *Academy of Management Journal*, 44(1), 13–28.
- Hoisl K., Gruber M., Conti A. (2017). R&D team diversity and performance in hypercompetitive environments, *Strategic Management Journal*, 38(7), 1455-1477.
- Hosseini, S., Fallon, G., Weerakkody, V., & Sivarajah, U. (2019). Cloud computing utilization and mitigation of informational and marketing barriers of the SMEs from the emerging markets: Evidence from Iran and Turkey. *International Journal of Information Management*, 46, 54-69.

- ISTAT – Italian National Institute of Statistics (2020). Commercio con l'estero, comunicato stampa. Available at: <https://www.istat.it/it/archivio/238593> (Accessed on 20th February 2020).
- Kagermann, H., Wahlster, W., Helbig, J., Hellinger, A., Stumpf, M.A.V., Treugut, L., Blasco, J., Galloway, H., Findelee, U., (2013). Securing the future of German manufacturing industry: recommendations for implementing the strategic initiative INDUSTRIE 4.0. Final Report of the Industrie 4.0 Working Group.
- Kaleka, A. (2011). When exporting manufacturers compete on the basis of service: Resources and marketing capabilities driving service advantage and performance. *J. Int. Mark.*, 19, 40–58.
- Lambert, D.M. and Harrington, T.C. (1990). “Measuring nonresponse bias in customer service mail surveys”, *Journal of Business Logistics*, 11 (2), 5-25.
- Lecerf, M., and Omrani, N. (2019). SME internationalization: The impact of information technology and innovation, *Journal of the Knowledge Economy*, 1-20.
- Lee, C.K.H. (2017). A GA-based optimisation model for big data analytics supporting anticipatory shipping in Retail 4.0, *International Journal of Production Research*, 55(2), 593-605.
- Lindskov A., Sund K.J., Dreyer J.K. (2021). The search for hypercompetition: evidence from a Nordic market study, *Industry and Innovation*, 10.1080/13662716.2020.1848521
- Luo, Y., Zhao, J. H., & Du, J. (2005). The internationalization speed of e-commerce companies: An empirical Analysis. *International Marketing Review*, 22, 693–709.
- Mangiaracina, R., Perego, A., Seghezzi, A., and Tumino, A. (2019). Innovative solutions to increase last-mile delivery efficiency in B2C e-commerce: a literature review. *International Journal of Physical Distribution & Logistics Management*, 49(9), 901-920.
- McElheran, K. (2015). Do market leaders lead in business process innovation? The case(s) of e-business adoption. *Management Science*, 61(6), pp. 1197–1216.
- McEvily, B., & Zaheer, A. (1999). Bridging ties: A source of firm heterogeneity in competitive capabilities. *Strategic management journal*, 20(12), 1133-1156.
- Mariani, M., & Borghi, M. (2019). Industry 4.0: A bibliometric review of its managerial intellectual structure and potential evolution in the service industries. *Technological Forecasting and Social Change*, 119752
- Martens B., (2013), What does Economic Research tell us about Cross-border e-Commerce in the EU Digital Single Market? A Summary of Recent Research, Institute for Prospective Technological Studies Digital Economy Working Paper 2013/05, ISBN 978-92-79-28813-5 ISSN 1831-9424 (online), doi:10.2791/83255.
- Mathews S., Healy M., & Wickramasekera R. (2012). The internetisation of information, knowledge, and interaction components of the firm's internationalisation process. *Journal of Marketing Management*, 28(5-6): 733-754.
- Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Review: Information technology and

- organizational performance: An integrative model of IT business value. *MIS Quarterly*, 28(2), 283–322
- Mahto, R. V., Ahluwalia, S., & Walsh, S. T. (2018). The diminishing effect of VC reputation: Is it hypercompetition?. *Technological forecasting and social change*, 133, 229-237.
- Morgan-Thomas, (2009), Online activities and export performance of the smaller firm: a capability perspective, *European J. International Management*, 3(3), 266-285.
- Nassimbeni, G. (2001). Technology, innovation capacity, and the export attitude of small manufacturing firms: a logit/tobit model. *Research Policy*, 30(2), 245-262.
- Nguyen, D. H., de Leeuw, S., & Dullaert, W. E. (2018). Consumer behaviour and order fulfilment in online retailing: A systematic review. *International Journal of Management Reviews*, 20, 255–276
- Oesterreich and Teuteberg (2019). The role of business analytics in the controllers and management accountants' competence profiles: An exploratory study on individual-level data, *Journal of Accounting and Organizational Change*, 15(2), 330-356.
- Onkelinx J., Manolova T. S., Edelman L. F., (2016), The human factor: Investments in employee human capital, productivity, and SME internationalization, *Journal of International Management*, 22 (2016) 351–364.
- Pavlou, P. A., & El Sawy, O. A. (2010). The “third hand”: IT-enabled competitive advantage in turbulence through improvisational capabilities. *Information systems research*, 21(3), 443-471.
- Penrose, E. T. (1958). *The Theory of the Growth of the Firm*. New York: Wiley.
- Peteraf, M., Di Stefano, G., & Verona, G. (2013). The elephant in the room of dynamic capabilities: Bringing two diverging conversations together. *Strategic management journal*, 34(12), 1389-1410.
- Peteraf, M. (1993). The Cornerstones of Competitive Advantage: A Resource-Based View Margaret. *Strategic Management Journal*, 14(3), 179–191.
- Pezderka, N., and Sinkovics, R.R. (2011). A conceptualisation of e-risk perceptions and implications for small firm active online internationalisation, *International Business Review*, 20, 409-422.
- Polanski, P.P. (2002), "A new approach to regulating internet commerce: Custom as a source of electronic commerce law", *Electronic Communication Law Review*, 9(3), 165-205.
- Porter, M. E. (1985) *The Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Free Press.
- Porter, M. E. (1980). *Generic competitive strategies*. *Competitive strategy*. New York: Free Press.
- Priem, R. L., & Butler, J. E. (2001). Is the Resource-Based for Strategic Management Perspective Research ? *Academy of Management Review*, 26(1), 22–40.
- Ramanathan, R., George, J. and Ramanathan, U. (2014), *The role of logistics in E-commerce*

- transactions: An exploratory study of customer feedback and risk in *Supply Chain Strategies, Issues and Models*, 221-233.
- Ramanathan, R., Ramanathan, U., & Hsiao, H. L. (2012). The impact of e-commerce on Taiwanese SMEs: Marketing and operations effects. *International Journal of Production Economics*, 140(2), 934-943.
- Ramon-Jeronimo, J. M., Florez-Lopez, R., & Araujo-Pinzon, P. (2019). Resource-Based View and SMEs Performance Exporting through Foreign Intermediaries: The Mediating Effect of Management Controls. *Sustainability*, 11(12), 3241.
- Ricardo, D. (1817). *Principles of political economy and taxation*. London, England: J Murrary.
- Rimmer, P. J., & Kam, B. H. (2018). *Consumer logistics: Surfing the digital wave*. Northampton, Massachusetts, USA: Edward Elgar Publishing.
- Roberts, N., & Grover, V. (2012). Investigating firm's customer agility and firm performance: The importance of aligning sense-and-respond capabilities. *Journal of Business Research*, 65(5), 579–585
- Royle, J. and Laing, A. (2014). The digital marketing skills gap: Developing a Digital Marketer Model for the communication industries, *International Journal of Information Management* 34 (2014) 65–73.
- Rumelt, R. (1984). Towards a strategic theory of the firm. In R. Lamb (Ed.), *Competitive strategic management* (pp. 556–570). Englewood Cliffs, NJ: Prentice-Hall.
- Rusmann, M., Lorenz, M., Gerbert, P., Waldner, M., Justus, J., Engel, P., Harnisch, M., (2015). *Industry 4.0: the future of productivity and growth in manufacturing industries*. Boston Consulting Group 9 Available at: https://www.bcg.com/publications/2015/engineered_products_project_business_industry_4_future_productivity_growth_manufacturing_industries.aspx (Accessed on 23 February 2020).
- Sainio, L. M., Ritala, P., and Hurmelinna-Laukkanen, P. (2012). Constituents of radical innovation—exploring the role of strategic orientations and market uncertainty. *Technovation*, 32(11), 591-599.
- Sapienza H. J., Autio E., George G., Zahra S. A., (2006), A capabilities perspective on the effects of early internationalization on firm survival and growth, *Academy of Management Review*, 31(5): 914–933.
- Schwab, Klaus. *The fourth industrial revolution*. Currency, 2017.
- Schu, M., Morschett, D., & Swoboda, B. (2016). Internationalization speed of online retailers: A resource-based perspective on the influence factors. *Management International Review*, 56(5), 733–757.
- Sinkovics, R.R., Yamin, M., and Hossinger, M. (2007), Cultural adaptation in cross border e-commerce: a study of german companies, *Journal of Electronic Commerce Research*, 8(4), 221-235.
- Stockdale, R., & Standing, C. (2006). A classification model to support SME e-commerce adoption initiatives. *Journal of Small Business and Enterprise Development*, 13 (3), 381-

- Teece, D.J. (2017), "Dynamic Capabilities and (Digital) Platform Lifecycles", *Entrepreneurship, Innovation, and Platforms (Advances in Strategic Management, Vol. 37)*, Emerald Publishing Limited, pp. 211-225.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management *Strategic Management Journal*, 18(7), 509–533.
- Teece D., Pisano G. (1994). The dynamic capabilities of firms: An introduction. *Industrial and Corporate Change*, 3 (3), 537-556.
- Teltscher, S. (2002), Electronic commerce and development: Fiscal implications of digitized goods trading, *World Development*, 30(7), 1137-1158.
- Tolstoy, D., Nordman, E. R., Hånell, S. M., & Özbek, N. (2020). The development of international e-commerce in retail SMEs: An effectuation perspective. *Journal of World Business*, 101165.
- Trainor K. J., Andzulis J. M., Rapp A., & Agnihotri R. (2014). Social media technology usage and customer relationship performance: A capabilities-based examination of social CRM. *Journal of Business Research*, 67(6): 1201-1208.
- Van Beveren, I., & Vandenbussche, H. (2010). Product and process innovation and firms' decision to export. *Journal of Economic Policy Reform*, 13(1), 3–24.
- Vakulenko, Y., Shams, P., Hellström, D., & Hjort, K. (2019). Service innovation in ecommerce last mile delivery: Mapping the e-customer journey. *Journal of Business Research*, 101, 461-468.
- Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2019). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889-901.
- Vermeulen F., Barkema H., (2002), Pace, rhythm, and scope: Process dependence in building a profitable multinational corporation, *Strategic Management Journal*, 23(7): 637–654.
- Wamba, S. F., & Queiroz, M. M. (2020). Industry 4.0 and the supply chain digitalisation: a blockchain diffusion perspective. *Production Planning & Control*, 1-18.
- Watson, G.F. IV, Weaven, S., Perkins, H., Sardana, D., and Palmatier, R.W. (2018), International market entry strategies: Relational, digital, and hybrid approaches, *Journal of International Marketing*, 26 (1), 30-60.
- Wen-Tsung H., Hsiang-Lan C., Chia-Yi C., (2013), Internationalization and firm performance of SMEs: The moderating effects of CEO attributes, *Journal of World Business*, 48, 1–12,
- Wernerfelt. (1984). A Resource Based View of the Firm. *Strategic Management Journal*, 5(171), 180.
- Yeow, A., Soh, C., & Hansen, R. (2018). Aligning with new digital strategy: A dynamic capabilities approach. *The Journal of Strategic Information Systems*, 27(1), 43-58.

Zaheer, S., and Manrakhan, S. (2001), "Concentration and dispersion in global industries: Remote electronic access and the location of economic activities". *Journal of International Business Studies*, Vol. 32, No. 4, pp. 667–686.

TABLES

Table 1: Summary of the variables, type, proxy, source and main statistics

No.	Variable	Type	Proxy	Source	Statistics (Total Companies: 102)
1	<i>Digital Export</i>	Dependent variable	Dummy equal to 1 if the firm undertake digital export	Survey "Digital Export Observatory"	Digital export - yes : 46 companies Digital export - no : 56 companies
2	<i>Assets Size</i>	Explanatory variable	Total Assets	Orbis	Digital Export Companies: 330,611 € No Digital Export Companies: 2,635,460 € (Average values)
3	<i>Digital technologies</i>	Explanatory variable	Dummy equal to 1 if the firms has adopted a digital technology	Survey "Digital Export Observatory"	Digital Technologies - yes: 46 companies Digital Technologies - no: 56 companies
4	<i>Export Manager</i>	Explanatory variable	Dummy equal to 1 if an export manager is present in the firm	Survey "Digital Export Observatory"	Export Manager - yes: 85 companies Export Manager - no: 17 companies
5	<i>E-commerce Manager</i>	Explanatory variable	Dummy equal to 1 if an e-commerce manager is present in the firm	Survey "Digital Export Observatory"	E-commerce Manager-yes: 45 companies E-commerce Manager - no: 57 companies
6	<i>Firm's Age</i>	Control Variable	Difference between the year 2019 and the incorporation year of the firm	Orbis	Average age: 35.5
7	<i>Firm's Productivity</i>	Control Variable	Ratio between the total sales and total assets of the firm	Orbis	Average productivity: 1.2
8	<i>Joint Stock Company</i>	Control Variable	Dummy equal to 1 if the firms is a joint stock company	Orbis	Joint Stock Firms - yes: 70 companies Joint Stock Firms - no: 32 companies
9	<i>Food & Beverage</i>	Control Variable	Dummy equal to 1 if the firms operates in the food and beverage industry	Survey "Digital Export Observatory"	Food and beverage firms: 36
10	<i>Fashion</i>	Control Variable	Dummy equal to 1 if the firms operates in the fashion industry	Survey "Digital Export Observatory"	Fashion firms: 44
11	<i>Furniture</i>	Control Variable	Dummy equal to 1 if the firms operates in the furniture industry	Survey "Digital Export Observatory"	Furniture firms: 22

Table 2: Correlations and descriptive statistics of the dependent and explanatory variables

Variables	1	2	3	4	5	6	7	8	9	10	11
1 <i>Digital Export</i>	1.000										
2 <i>Assets Size</i>	-0.115	1.000									
3 <i>Digital technologies</i>	0.267	-0.098	1.000								
4 <i>Export Manager</i>	-0.035	0.048	0.088	1.000							
5 <i>E-commerce Manager</i>	0.448	0.142	0.107	-0.133	1.000						
6 <i>Firm's Age</i>	-0.119	-0.028	-0.061	0.173	-0.093	1.000					
7 <i>Firm's Productivity</i>	0.089	-0.095	0.134	0.059	0.087	-0.066	1.000				
8 <i>Joint Stock Company</i>	-0.146	0.091	0.061	0.095	-0.038	0.359	-0.201	1.000			
9 <i>Food & Beverage</i>	-0.238	0.157	0.032	0.110	-0.160	0.154	-0.037	0.190	1.000		
10 <i>Fashion & Apparel</i>	0.193	-0.094	-0.034	-0.248	0.422	-0.123	0.102	-0.008	-0.643	1.000	
11 <i>Furniture</i>	0.044	-0.069	0.004	0.171	-0.322	-0.030	-0.080	-0.211	-0.387	-0.457	1.000
Observations	102	102	102	102	102	102	102	102	102	102	102
Mean	0.549	0.013	0.451	0.833	0.441	35.529	1.288	0.686	0.353	0.431	0.216
Std. Dev.	0.500	1.057	0.500	0.375	0.499	25.908	1.279	0.466	0.480	0.498	0.413
Min	0.000	-0.132	0.000	0.000	0.000	2.000	0.000	0.000	0.000	0.000	0.000
Max	1.000	10.450	1.000	1.000	1.000	172.000	12.610	1.000	1.000	1.000	1.000

Table 3: Results of the Robust Probit model (dependent variable: *Digital Export*)

	(1)	(2)	(3)	(4)	(5)	(6)
	Coefficients	Marginal Effects	Coefficients	Marginal Effects	Coefficients	Marginal Effects
<i>Assets Size</i>	-1.069 (0.808)	-0.301 (0.224)	-	-	-1.132 (0.798)	-0.316 (0.218)
<i>Digital technologies</i>	0.750*** (0.277)	0.211*** (0.075)	0.779*** (0.277)	0.225*** (0.075)	-	-
<i>Export Manager</i>	-0.082 (0.421)	-0.023 (0.119)	-0.139 (0.423)	-0.040 (0.122)	-0.002 (0.422)	-0.001 (0.118)
<i>E-commerce Manager</i>	1.522*** (0.364)	0.428*** (0.073)	1.352*** (0.322)	0.389*** (0.069)	1.509*** (0.363)	0.422*** (0.072)
<i>Firm's Age</i>	0.003 (0.007)	0.001 (0.002)	-0.000 (0.006)	-0.000 (0.002)	0.003 (0.007)	0.001 (0.002)
<i>Firm's Productivity</i>	0.005 (0.110)	0.002 (0.031)	0.073 (0.158)	0.021 (0.045)	0.012 (0.115)	0.003 (0.032)
<i>Joint Stock Company</i>	-0.415 (0.350)	-0.117 (0.099)	-0.472 (0.360)	-0.136 (0.104)	-0.388 (0.353)	-0.108 (0.099)
<i>Food & Beverage</i>	-0.738* (0.416)	-0.208* (0.112)	-0.842** (0.419)	-0.243** (0.115)	-0.643 (0.420)	-0.180 (0.114)
<i>Fashion and Apparel</i>	-0.543 (0.469)	-0.153 (0.130)	-0.527 (0.450)	-0.152 (0.128)	-0.411 (0.477)	-0.115 (0.131)
<i>Employees Size</i>	-	-	0.078 (0.195)	0.023 (0.056)	-	-
<i>Digital technologies intensity</i>	-	-	-	-	0.333** (0.011)	0.093*** (0.010)
<i>Constant</i>	-0.176 (0.590)		-0.122 (0.662)		-0.281 (0.602)	
No. of observations	102		102		102	
Chi-Square	39.299		38.527		40.474	
P-value	0.000		0.000		0.000	

Standard Errors between brackets. Please note: * p<0.10, ** p<0.05, *** p<0.01