



Digital sales channels and the relationship between product and international diversification: Evidence from going digital retail MNEs

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Abstract

Research Summary: We argue that in the era of e-commerce, retail firms can simultaneously grow their product and international portfolio by adopting a multichannel strategy, that is, using digital and physical channels. Drawing on the resource bundling perspective, we argue that the previously advocated negative relationship between product and international diversification is mitigated by the retail firm's digital sales intensity. By separately examining product and international diversification across digital and physical channels, we find that while increased product diversification in physical channels relates negatively with international diversification in both physical and digital channels, increased product diversification in digital channels relates positively with international diversification in both channels. Our hypotheses are tested against a sample of 122 born physical - going digital retail MNEs over the period 2006–2016. **Managerial Summary:** The decision on how firm resources should be allocated for growing a firm's product and international scope has been a continuing debate in corporate strategy. While our research supports the conventional wisdom that product portfolio growth relates

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negatively to international market growth, we show that firms which increase their digital sales are able to mitigate the costs associated with this relationship. Based on longitudinal data of some of the world's largest retail MNEs, our research shows that retail firms with increased digital sales activity are more capable of mutually benefiting from simultaneously growing their product portfolio and international market presence. Therefore, if a retail firm aims at simultaneously growing its product portfolio and international market presence, it is advisable that they increase their proportion of digital sales (i.e., e-commerce activity).

KEYWORDS

digital sales, international diversification, multichannel growth strategy, product diversification, resource bundling perspective

1 | INTRODUCTION

Since the dawn of management research, we have come to understand that firms tend to draw on two forms of corporate growth strategy: product diversification and international diversification (Hitt, Hoskisson, & Ireland, 1994). The relationship between these two forms of diversification and their combined effect on firm performance have received considerable attention in the corporate strategy literature (e.g., Hashai & Delios, 2012; Kumar, 2009; Mayer, Stadler, & Hautz, 2015; Oh & Contractor, 2012; Rumelt, 1982; Stadler, Mayer, Hautz, & Matzler, 2018; Wiersema & Bowen, 2008, 2011). Although extant research investigating product and international diversification originally claimed a positive relationship (Denis, Denis, & Yost, 2002; Rondi, Sleuwaegen, & Vannoni, 2004), more recent studies, while controlling for potential endogeneity bias, have advocated for and found a negative relationship (Kumar, 2009; Mayer et al., 2015; Ref, 2015). More recently, research has attempted to explain the conditions under which these negative effects are compromised. Following Penrose's (1959) argument that growth is a dynamic interaction between endogenous and exogenous factors, extant research has examined both sides of the coin to identify such endogenous (Batsakis & Mohr, 2017; Boehe & Jiménez, 2018; Hashai & Delios, 2012; Mayer et al., 2015) and exogenous conditions (Hutzschenreuter & Gröne, 2009; Zúñiga-Vicente, Benito-Osorio, Guerras-Martín, & Colino, 2019).

Following a similar logic, we argue that the utilization of digital sales channels in a firm's corporate strategy, could be such a factor. This is consistent with recent research arguing that developments in information and communication technologies have relaxed managerial and organizational constraints associated with the coordination of a firm's operations abroad, thus making the combination of diversification strategies more attractive (Bowen & Sleuwaegen, 2017). Extant research has documented the wider benefits associated with the adoption of digital strategies in an IB context (Autio, Mudambi, & Yoo, 2021; Brouthers, Geisser, & Rothlauf, 2016; Chen, Shaheer, Yi, & Li, 2019; Monaghan, Tippmann, & Coviello, 2020; Ojala, Evers, & Rialp, 2018; Stallkamp & Schotter, 2021; Sturgeon, 2021). More

specifically, the process of embracing digital channels enables firms to develop and leverage digital business models for distributing their offer online (Autio et al., 2021; Monaghan et al., 2020), allowing for faster and deeper internationalization while promising a more limited resource footprint in host countries (OECD, 2018).

Although the benefits of embracing digital channels on firm internationalization are documented in the literature, the reality seems to be more complicated. One of the reasons is that embracing digital channels does not only involve born digital firms (Curchod, Patriotta, & Wright, 2020; Jean, Bryan, Kim, & Cavusgil, 2020; Monaghan et al., 2020; Ojala et al., 2018), but also going digital firms (Eden, 2018; Srinivasan & Eden, 2021), that is, the traditional bricks and mortar firms that were born physical and have only recently adopted digital channels. While much focus in recent studies has been on the idiosyncrasies of born digital firms (or ibusiness firms) in a global strategy context (Banalieva & Dhanaraj, 2019; Brouthers et al., 2016; Chen et al., 2019; Hennart, 2019; Stalkamp & Schotter, 2021), going digital firms that increasingly engage with digital sales, have not received a similar level of attention. This is echoed by the recent study of Srinivasan and Eden (2021, p. 231), which argues that “going digital MNEs represent the largest population of companies on the brink of substantial digitalization in the fourth industrial revolution”. In the same vein, Grewal, Gauri, Roggeveen, and Sethuraman (2021) contend that going digital retail MNEs will benefit from the adoption of e-commerce platforms and the shift to more digitally intensive processes.

Our study's research questions are thus motivated by the aforementioned recent developments at the intersection of embracing e-commerce, that is, achieving sales using digital channels, and international strategy.¹ Specifically, in this study we first pose the question of whether the relationship between product and international diversification for going digital firms will be mitigated by the firm's digital sales intensity (i.e., the ratio of a firm's digital sales to its total sales). In an attempt to answer this question, we contend that firms which commit more to digital sales will incur comparatively lower costs when simultaneously adopting a product and international diversification strategy. Second, we separately examine product and international diversification within digital and physical channels, to further illustrate the need for firms to bundle their competences with the requisite matching resources (digital or physical respectively) and successfully compete in the global marketplace (Verbeke & Asmussen, 2016; Verbeke & Hutzschenreuter, 2020). Digital product/international diversification refers to the extent of product/international scope within digital channels (i.e., utilizing e-commerce platforms), while physical product/international diversification refers to the extent of product/international scope within physical channels (i.e., utilizing physical stores). Next, we argue that each form of product diversification relates differently (i.e., positively vs. negatively) to each form of international diversification. Our study's research focus is ongoing digital retail MNEs, that is firms that sell or resell merchandise and goods to the general public without transformation which are also described to share similar strategic foreign expansion motivations (Mohr, Batsakis, & Stone, 2018; Powell, 2014). These firms are strongly affected by digital technologies (Grewal et al., 2021; Schu, Morschett, & Swoboda, 2016; Tolstoy, Nordman, Hånell, & Özbek, 2021) and increasingly embrace e-commerce, thus making them a very suitable setting for examining the impact of digital sales intensity on the relationship between product and international diversification.

Our study makes the following contributions. First, we contribute to expanding our knowledge with regards to the relationship between product and international diversification, by demonstrating that the expansion of digital channels is an important contingency in this long-established relationship, as it allows firms to more effectively commit to both strategies. Second,



by distinguishing between product and international diversification in physical and digital channels, we seek to further refine the rapidly advancing research stream in support of embracing digital channels in the IB and corporate strategy literature (Autio et al., 2021; Banalieva & Dhanaraj, 2019; Brouthers et al., 2016; Chen et al., 2019; Li, Chen, Yi, Mao, & Liao, 2019; Monaghan et al., 2020; Stallkamp & Schotter, 2021; Sturgeon, 2021). Third, we examine the product diversification – international diversification relationship beyond traditional theoretical prisms, such as the Penrosean perspective and the RBV, which have long dominated this discussion. Specifically, we draw our arguments from a relatively unexplored, yet related, theoretical tenet in the IB literature, that of the resource bundling perspective (Hennart, 2009; Verbeke & Kano, 2016) and postulate that the bundling of digital and physical channels can be deemed beneficial for the simultaneous diversification in terms of both product and international markets.

2 | THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

2.1 | The relationship between product and international diversification for going digital retail MNEs: A Penrosean perspective

Penrose (1959) in her seminal theory about the growth of the firm, was the first to observe that resource constraints, and more specifically, the absence of adequate managerial resources can be detrimental in a firm's attempt to grow its business activities (Pitelis, 2007). Extant research has indicated that an increase in one form of diversification results in trade-offs in the other form of diversification (Hashai & Delios, 2012; Kumar, 2009; Mayer et al., 2015; Wiersema & Bowen, 2008). Thus, limited resources constrain a firms' ability to simultaneously grow in two dimensions, leading them to a compromise between choosing one form of diversification over another (Ref, 2015). In particular, retail firms are constrained in their product and international diversification strategy, by the fact that the fungibility and transferability of their resources (e.g., physical stores, warehouses, managerial resources) are even more challenging and costly (Bowen & Sleuwaegen, 2017). For example, retail firms with a wider product portfolio are more likely to incur operational challenges resulting from the need to coordinate a more complicated supply chain management system within a wide network of foreign operations versus retail firms with a narrower portfolio (Narasimhan & Kim, 2002).

Further, retail MNEs systematically draw on a number of intangible assets in an attempt to quickly and widely expand their business activity (Mohr & Batsakis, 2014). Such intangible assets can be linked to a firm's branding, advertising, networking, or even more subtle and tacit in nature assets that cannot be easily observed, quantified and physically transferred. These are known to be “sticky” to a particular context and market and thus difficult to be transferred to other markets (Winter & Szulanski, 2001). This is also partly attributed to the causal ambiguity characterizing the value and impact of many of these intangible assets (Barney, 1991), thus making it even more difficult for firms to holistically transfer their competitive advantage to multiple foreign markets through conventional means. As a result, retail firms that seek to simultaneously grow their product lines and expand their presence in international markets are further constrained by their limited ability to also diversify their intangible assets responsible for adding value in the home location. Such a restriction in the transferability of intangible assets is also known as the congestion factor

(Teece, 1980), which overall suppresses the number of diversification opportunities a firm can leverage (Kumar, 2009).

Finally, retail firms that expand their product and international market offering will incur more costs associated with adjusting their product assortments, retail formats or even the locations of their stores according to the local preferences and market idiosyncrasies (Batsakis & Mohr, 2017; Bianchi, 2009; Oh, Sohl, & Rugman, 2015). The greater the product diversification, the greater the need for adaptation in case of a wide international expansion. Based on the aforementioned arguments we conclude that *product diversification will have a negative effect on the international diversification of going digital retail MNEs.*

2.2 | Embracing digital channels as a contingency: A resource bundling perspective

The introduction of digital technologies in the internationalization of firms has been viewed, in general, from a very positive perspective (Verbeke & Hutzschenreuter, 2020). The proponents of this perspective argue that it is network effects and network externalities that make international expansion of digital firms faster, wider and deeper (Brouthers et al., 2016; Chen et al., 2019; Ojala et al., 2018; Stallkamp & Schotter, 2021). However, it is more recently argued that the challenges of digitalization are downplayed (Sturgeon, 2021; Verbeke & Hutzschenreuter, 2020). More specifically, an international expansion utilizing digital channels does require these to be combined with the requisite physical channels (Grewal et al., 2021; Schu et al., 2016; Tolstoy et al., 2021). This view is echoed by recent advancements in the Information Systems literature which has identified the physical infrastructuring of digital platforms (Constantinides, Henfridsson, & Parker, 2018). Indeed, while traditional industries (e.g., oil production, power generation, heavy machinery, etc.) go through digital platformization, also benefitting from the decentralization of governance, digital platforms experience a more intense physical infrastructuring process which requires further deepening of their supply chain management (Constantinides et al., 2018; Rolland, Mathiassen, & Rai, 2018). The simultaneous growth and interrelationship between digital and physical channels is consistent with the resource bundling perspective, which suggests the need for MNEs to assemble complementary asset classes and has been previously identified as an important driver of internationalization (Hennart, 2009; Verbeke & Kano, 2016). Given this bundling requirement, we argue here that in the context of firm internationalization, the deployment of physical assets resonates with the presence of digital competencies. Accordingly, going digital retail MNEs are required to heavily invest in e-commerce platforms both domestically and abroad. For example, Walmart has experienced rapid growth in digital channel sales as it has developed a smartphone app that is being downloaded more frequently than Amazon's (Techcrunch, 2019), while M&S's entry into India was facilitated by its collaborative efforts with local e-commerce platforms (Business Standard, 2015).

Consequently, relying solely on physical channels does not allow retail firms to standardize operations as much as they could possibly achieve in the case of simultaneously leveraging physical and digital channels. In the retail sector in particular, firms that simultaneously opt for a product and international diversification strategy through physical channels alone, are not in a position to reap the advantages of e-commerce that could help them save on costs associated with standardized digital offerings (Li et al., 2019). Also, such firms face considerable difficulties in taking advantage of an e-commerce platform's capability to more quickly and efficiently



achieve scalability and fungibility across product offerings (Monaghan et al., 2020; Verbeke & Hutzschenreuter, 2020). We therefore proceed by arguing that going digital retail MNEs that have achieved a comparatively higher level of digital intensity in their sales, will be more efficient at dealing with the strains of simultaneous product and international diversification strategy.

First, going digital retail MNEs which invest more intensively in developing digital channels are more likely to reduce their physical footprints (Verbeke & Hutzschenreuter, 2020) and become more effective in achieving global dispersion of supply and distribution. Such firms can also be more effective in dealing with institutional idiosyncrasies in the foreign location. For example, retail MNEs can enter institutionally less adjacent markets with an emphasis in digital presence and reduced physical assets while locating the core of their physical assets (e.g., central warehouses, majority of retail stores, distribution networks) in institutionally similar markets. As a result, digitally-aware retail MNEs are more agile and their digital sales intensity can mitigate many of the costs associated with simultaneous growth in product and international scope (Verbeke & Hutzschenreuter, 2020).

Second, retail MNEs which adopt a purely physical diversification strategy fail to reap the benefits of e-commerce platforms. More specifically, e-commerce platforms have been found to allow going digital firms to access shared resources (e.g., use of standardized platforms and technologies, collaborative e-commerce efforts) and thus alleviate the costs associated with physical channels (Nambisan, Zahra, & Luo, 2019). In this manner, e-commerce platforms and their associated technologies are – as compared to the resources and capabilities of purely physical retail firms – more readily transferable and fungible across markets, allowing retail firms to quickly build and leverage economies of scale. Purely digital retailers still need to have some physical presence in foreign markets for the purposes of facilitating business development, gaining legitimacy and engaging with stakeholders (Coviello, Kano, & Liesch, 2017; Stallkamp & Schotter, 2021; Verbeke & Hutzschenreuter, 2020). Yet, the increasing costs of simultaneously committing resources to both product and international scope can be more efficiently mitigated by adopting digital means (e.g., via simultaneously launching an e-commerce platform in multiple markets).

Third, retail MNEs can further benefit from digital competences, such as the systematic application of automation processes and the leveraging of wider network effects (Monaghan et al., 2020). Through automation, retail firms can lower the cost of communicating with customers in foreign markets, since e-commerce platforms can offer effective and impactful tools, such as trust mechanisms, reviews, ratings, certifications, that allow retail firms to both gain legitimacy and efficiency that otherwise would very much depend on the retail firm's ability to physically penetrate the foreign market. For example, through online channels, retailers can provide opportunities for webrooming, that is, allow shoppers to seek information online and buy offline, resulting in lower information/marketing costs compared to these of a purely physical strategy (Verhoef, Kannan, & Inman, 2015).

Overall, through a bundled strategy, retailers are presented with more opportunities to replace or even complement some of the resource-intensive physical activities through less resource-intensive digital counterparts (Falk & Hagsten, 2015; Pauwels & Neslin, 2015; Tolstoy et al., 2021; Yadav & Varadarajan, 2005). This alleviates some of the resource constraints and releases resources to expand to or serve multiple markets (Tolstoy et al., 2021). Also, network effects can be more fully, directly and quickly leveraged through digital processes (Shaheer & Li, 2020). For example, retail firms can create a digital space (e.g., digital app, virtual community, online forum) where customers can interact, share information and views that can in turn

create demand-side externalities for the firm and strengthen the retailer's reputation in the foreign market. Based on the aforementioned arguments we conclude that:

Hypothesis (H1). *The negative effect of product diversification growth on international diversification growth will be weaker for going digital retail MNEs with high levels of digital sales intensity.*

2.3 | An extended multichannel view: Segmenting product diversification and international diversification to digital and physical channels

In the previous section, we stressed the importance of digital sales intensity in mitigating the negative relationship between product and international diversification. While we argue that digital sales intensity is critical for the simultaneous diversification strategy of retail MNEs, it is however not clear how the relationship between product and international diversification may vary across digital and physical channels. In other words, while going digital retail MNEs leverage both digital and physical channels to sell their products, product diversification strategy in each of these two channels may have a diverging effect in a firm's internationalization in each of these two channels (i.e., digital and physical). We therefore draw on extant literature (e.g., Hashai & Delios, 2012; Mayer et al., 2015; Ref, 2015) and separately examine the effect of product diversification in digital and physical channels on international diversification in digital and physical channels. Overall, we argue about the positive effect of digital product diversification on international diversification and the negative effect of physical product diversification on international diversification.

First, digital product diversification benefits from offering products through an e-commerce platform both rapidly and extensively. This is achieved by implementing a standardized global marketing strategy (Alhorr, Singh, & Kim, 2010) thus achieving increased product awareness and brand recognition across markets (Tolstoy et al., 2021). Second, digital channels provide retailers with the capacity to offer a broader and more diversified product offering due to their ability to remove the spatial constraints of the more conventional physical channel (Verbeke & Hutzschenreuter, 2020). Third, product diversification growth in digital channels can benefit from being comparatively more scalable across markets since e-commerce platforms are known for rapidly building and leveraging economies of scale across different product markets (Monaghan et al., 2020; Yadav & Varadarajan, 2005). Based on the aforementioned arguments we conclude that:

Hypothesis (H2). *Product diversification growth within digital channels will have a positive effect on overall international diversification growth, digital international diversification growth and physical international diversification growth for going digital retail MNEs.*

On the other hand, unlike digital product diversification, which is a comparatively less bounded strategy, physical product diversification is characterized by spatial- and time-related boundedness. This is mainly due to the fact that most retail products require a high degree of local responsiveness and adaptation to cultural needs and other consumer-specific idiosyncrasies (Verbeke & Hutzschenreuter, 2020). Further, higher levels of physical product



diversification demand increased levels of costly resources such as shelf space (Murray, Talukdar, & Gosavi, 2010), which can be a constraint when seeking to expand to new markets internationally. Such physical constraints can be considerably relieved when using e-commerce platforms (Banalieva & Dhanaraj, 2019). Therefore, product diversification growth in physical channels is a process requiring substantial amount of slack resources, both in terms of tangible (e.g., location premium, large stores, fungible managerial resources) and intangible assets (e.g., replicable know-how, fungible reputation). As a result, this can be a relatively slower, less efficient and costlier process due to the larger needs for physical footprint. Based on the aforementioned arguments we conclude that:

Hypothesis (H3). *Product diversification growth within physical channels will have a negative effect on overall international diversification growth, digital international diversification growth and physical international diversification growth for going digital retail MNEs.*

Table 1 summarizes the aforementioned theory-driven arguments supporting the benefits of embracing digital channels for going digital retail MNEs.

3 | DATA AND METHODS

3.1 | Research setting, sample and data collection process

In order to examine the role of digital sales intensity, we focus on the retail sector. Specifically, we draw on the largest going digital retail MNEs with a B2C focus – the traditional bricks and mortar firms that were born physical and have adopted digital channels. We argue that the retail sector is an optimal research setting for testing our hypotheses. First, retail firms are increasingly concerned with their internationalization strategy (Hendriks, 2020) due to the increasing time-based competition experienced by service-sector firms in general and retailers in particular (Mentzer, Min, & Zacharia, 2000). Second, the retail sector is one of the key industries that have embraced e-commerce (Bernstein, Song, & Zheng, 2008; Chang, Chung, & Jungbien Moon, 2013; Grewal et al., 2021; Herhausen, Binder, Schoegel, & Herrmann, 2015; Ofek, Katona, & Sarvary, 2011). Specifically, retail firms are deeply embedded in a conventional marketplace that has been disrupted by digital innovation. Thus, as they face the challenge of born digital retailers, they are forced to transform digitally and strive for higher levels of multi-channel integration. In fact, “bricks and mortar” retail firms are constantly seeking to increase their market share through the integration of multiple channels (Bell, Gallino, & Moreno, 2014; Brynjolfsson, Hu, & Rahman, 2013; Cao & Li, 2015).

Our research focus is on the largest B2C going digital retail MNEs having both physical and digital international presence in one or more foreign markets for the 11-year period between 2006 and 2016. We choose 2006 as our cutoff year as it is widely considered the start of the “second half of the chessboard”, that is, the major take-off point of the current digital revolution (Brynjolfsson & McAfee, 2014), which has greatly influenced e-commerce. The main source of our data is the PlanetRetail database. Recent empirical studies on the internationalization process in the retail sector have used this database (e.g., Batsakis & Theoharakis, 2021; Oh et al., 2015; Sohl & Folta, 2021; Swoboda, Elsner, & Olejnik, 2014). PlanetRetail sources longitudinal information, such as the number of outlets each retailer has opened and the number of

TABLE 1 Costs of simultaneous growth strategy and benefits (i.e., alleviating effect) of going digital retail firms' digital sales intensity

Costs associated to simultaneous growth strategy	How digital sales intensity alleviates the costs associated to simultaneous growth strategy
Retail firms due to their market-seeking internationalization goal are naturally bounded by limited resources, such as limited managerial resources and physical assets. Such limited resources put strains on retail firms' ability to simultaneously grow in two dimensions, thus leading them to a compromise of choosing one form of diversification over another	A going digital retail firm, as any other digital firm, will build and leverage digital infrastructure to accumulate and expand its communication, collaboration and IT-related competences, allowing them to be more capable of creating and selling its offering both physically and digitally through a multichannel (hybrid) business model
Retail firms are constrained by the fact that the fungibility and transferability of their physical resources (e.g., physical stores, warehouses, managerial resources) is a challenging and costly procedure	A high level of digital sales intensity will allow retail firms to more readily transfer their business model. Digital sales intensity can help scale product lines and make them fungible across markets as going digital retailers can more quickly build and leverage economies of scale through digital means
Retail firms with a wider physical product portfolio are more likely to incur more operational challenges resulting from the need to coordinate a complicated supply chain management system within a wide network of physical foreign operations	Digital sales channels give retail firms more flexibility in terms of tapping into managerial resources and talent (web designers, digital nomads, web retail experts) globally without the need of global sourcing. Also, digital sales intensity can facilitate scalability due to the rapid replicability of the digital business model, thus allowing retail firms to internationalize both more rapidly and widely, as well as with less physical footprint
Retail firms' intangible assets are traditionally linked to a firm's branding, advertising, networking, or even other, subtler and more tacit form of physical knowledge. These assets are known to be "sticky" to a particular regional context and market, and thus, difficult to transfer to other more distant markets	Intangible assets associated to the digital sales intensity of going digital retail firms are likely to be more globally renowned and quickly transferrable. This is because digital sales channels allow retail firms to develop e-commerce-related capabilities pertaining to direct engagement with stakeholders, automation and network effects that can be replicated across markets
Retail firms that expand their physical product and international (market) offering will incur more costs associated with adjusting their product assortments, retail formats or even the locations of their stores according to the local preferences and market idiosyncrasies. The greater the physical product diversification (i.e., in physical stores), the greater the need for adaptation in case of a wide international expansion	Going digital retail firms, which increasingly draw on digital sales channels, do not require a high degree of adaptation/local responsiveness to different market settings. Unlike physical channels, digital channels (e-commerce platforms) are to a great extent standardized or comparatively more standardized than physical marketplaces, thus giving them the opportunity to globally offer their product portfolio at a relatively lower cost

sales of each retailer per product category with the respective format (digital, physical) in a given country and a given year, on the largest retailers in the world. Then, we merged the retail-specific information with additional firm-level data that we collected from Bureau van



Dijk's OSIRIS database, which provides firm-level data on listed and major unlisted/delisted companies around the world. Since our research setting focuses on going digital retailers, we set the following restriction to our sample; we excluded firms that are born digital, that is they have shown no physical sales activity during the examined period. After applying the above restrictions, our final dataset consists of 1,029 firm/year observations sourced from 122 retail MNEs, which originate from 24 different home countries and covers the 11-year period 2006–2016.

3.2 | Measures

3.2.1 | Dependent variable

To measure our dependent variable, that is, International Diversification (ID), we use Jacquemin and Berry's (1979) entropy measure of diversification. This entropy measure has been widely used in extant research for assessing the level of international diversification (e.g., Chang & Wang, 2007; Hitt, Hoskisson, & Kim, 1997). ID is calculated as: $\sum P_i \ln(1/P_i)$, where P_i is the percentage of sales in country i ; and $\ln(1/P_i)$ is the particular weight of each country. Instead of using diversification levels, we measure changes (Δ), also echoing past studies and aiming at reflecting inter-temporal dynamics which are also central to our theoretical argumentation (e.g., Gaur & Kumar, 2009; Hutzschenreuter & Gröne, 2009; Mayer et al., 2015). This means that the final variable, ΔID , is the difference from year $t-1$ to year t . Further, we break down the ID measure to $ID_{digital}$ and $ID_{physical}$. In such a way, we distinguish international diversification into two separate activities: digital and physical. $ID_{digital}$ is calculated as: $\sum P_{id} \ln(1/P_{id})$, where P_{id} is the percentage of digital sales in country i ; and $\ln(1/P_{id})$ is the particular weight of each country. Similarly, $ID_{physical}$ is calculated as: $\sum P_{is} \ln(1/P_{is})$, where P_{is} is the percentage of physical (store) sales in country i ; and $\ln(1/P_{is})$ is the particular weight of each country. Once again, instead of using diversification levels, we measure changes (Δ) in the digital and physical international diversification levels. This means that the final variables, $\Delta ID_{digital}$ and $\Delta ID_{physical}$, are the difference from year $t-1$ to year t .

3.2.2 | Independent variables

To measure our key explanatory variable, Product Diversification, we once again follow past literature (e.g., Fong, 2010; Li & Tang, 2010; Wiersema & Bowen, 2008) and employ Jacquemin and Berry's (1979) entropy measure of diversification. Accordingly, PD is calculated as: $\sum P_j \ln(1/P_j)$, where P_j is the percentage of sales in product category j ; and $\ln(1/P_j)$ is the particular weight of each product category (each retailer's product categorization ranges from one to eight product lines, that is, grocery; clothing and footwear; electricals and office; food service; health and beauty; home, garden, auto; leisure and entertainment; other). Once again, instead of using diversification levels, we measure changes (Δ). This means that the final variable, ΔPD , is the difference from year $t-1$ to year t . Further, we break down the PD measure to $PD_{digital}$ and $PD_{physical}$. $PD_{digital}$ is calculated as: $\sum P_{jd} \ln(1/P_{jd})$, where P_{jd} is the percentage of digital sales in product category j ; and $\ln(1/P_{jd})$ is the particular weight of each product category. Similarly, we

calculated $PD_{physical}$ as: $\sum P_{js} \ln\left(\frac{1}{P_{js}}\right)$, where P_{js} is the percentage of physical (store) sales in product category j ; and $\ln\left(\frac{1}{P_{js}}\right)$ is the particular weight of each product category. In the same vein, instead of using diversification levels, we measure changes (Δ) in the digital and physical product diversification levels. Therefore, the final variables, $\Delta PD_{digital}$ and $\Delta PD_{physical}$, are the difference from year $t-1$ to year t .

3.2.3 | Moderating variable

Our moderating variable, *Digital sales intensity*, is measured as the ratio of a retail firm's digital sales to its total sales (e.g., Dzyabura, Jagabathula, & Muller, 2019; Narang & Shankar, 2019). High *digital sales intensity* ratio denotes relatively greater adoption of digital channels as well as higher exposure to digital technologies for the retail firm.

3.2.4 | Control variables

In addition to the dependent and the key explanatory variables, our study incorporates traditionally important control variables that are considered to have an effect on the internationalization of retail firms. In terms of firm-level control variables, we first included the size and the age of the MNE through employing the firm's total assets and number of years since the time of incorporation, respectively (Gaur & Delios, 2015). On both occasions, we log-transformed the variables. We also controlled for firm *international experience*, a known determinant of retail firm internationalization. This is measured as the accumulated number of years the focal firm has operated in each different foreign country (Mohr & Batsakis, 2014). Further, we controlled for retailer *profitability*, measured as the 3-year average return on assets (Carpenter & Sanders, 2002; Kunisch, Menz, & Cannella, 2019), in order to assess the retailer's ability to generate excess funds. The 3-year period is used in order to alleviate any abnormalities related to a single year's performance. Also, to control for the focal firm's intangible capabilities, we accounted for retailer *intangible assets*, measured as a firm's intangible assets to its total assets (Chang et al., 2013). Finally, we controlled for *firm financial leverage*, measured as the ratio of a firm's debt to its total assets, in an attempt to capture the financial strength of the firm (Hitt, Bierman, Uhlenbruck, & Shimizu, 2006).

Apart from the aforementioned firm-level controls, we also included a number of variables to control for country- and industry-level idiosyncrasies. First, since digital sales intensity plays a central role in the examination of our research question, we control for the *host countries' average internet penetration* score measured as the number of internet users per 100 people averaged across all host countries where the focal retailer has an active presence in the focal year. A relatively high level of internet penetration in host markets can induce a retailer's digital international activity. This measure has been used extensively in IB research to capture a country's communication and technology capabilities (Cumming, Knill, & Syvrud, 2016), global connectiveness (Berry, Guillén, & Zhou, 2010), as well as access to information and communication technology (DiRienzo, Das, Cort, & Burbridge, 2007). The data are sourced from the World Bank. Second, to account for potential asymmetric distance issues between the home country and the retailer's host countries, we control for *cultural diversity*. This variable is calculated as



the weighted average of cultural distance. Specifically, a weight for the country-specific cultural distance is included as the ratio of the number of outlets in the foreign country over the total number of foreign outlets. To develop this construct we adopted the formula initially suggested by De Jong and van Houten (2014). For the creation of this variable, we drew on Hofstede's four cultural dimensions (Hofstede, 2001) and constructed a composite variable using the Euclidean method (Konara & Mohr, 2019). Further, to account for the market-seeking motives of retail MNEs, we control for the average market size of the host countries. We thus incorporate the average *GDP* in all foreign countries of operation (a logarithmic transformation has been applied to this measure). Finally, also following prior research in the context of retail internationalization (e.g., Hendriks, Slangen, & Heugens, 2018; Leknes & Carr, 2004), we incorporated a series of sector-related dichotomous variables to control for the firm's core product segment, which is commonly defined as the *product segment* that generates the largest revenue for the retailer (Wiersema & Bowen, 2008). Each dichotomous variable takes the value 1 when the retailer's main revenue source is from that product category and 0 otherwise. The eight product categories are: grocery; clothing and footwear; electricals and office; food service; health and beauty; home, garden, auto; leisure and entertainment; other. Table 2 provides short definitions and data sources for all variables used in this study.

3.3 | Analysis

The panel formation of our dataset naturally leads to the employment of a generalized least squares estimator to examine the relationship between product and international diversification. However, one of the key concerns in modeling this relationship is reverse causality and potential endogeneity between the two forms of diversification (Mayer et al., 2015). In order to address this potential endogeneity issue, we use an instrumental variable two stage least squares (2SLS IV) model in a panel data framework. Specifically, we use the `xtivreg2, fe` command on STATA v.15, which applies a 2SLS fixed effects estimator with instrumental variables for panel data models.² With regards to the model specification, we consult the corporate strategy literature (Koh, Qian, & Wang, 2014; Lee & Song, 2012; Tripsas, 1997) as well as past studies examining the PD – ID relationship (Hutzschenreuter & Gröne, 2009; Mayer et al., 2015) and instrumented the endogenous diversification change variable (ΔPD) with lagged observations of it. Specifically, we use one-year lagged observations of (a) the respective measure (i.e., ΔPD) and (b) the original variable (PD). The two instrumental variables, lagged ΔPD and lagged PD are significantly correlated with the independent variable, ΔPD (0.74 and 0.06 respectively, $p < .05$), while they do not significantly correlate with the dependent variable, ΔID (-0.01 and 0.03 respectively, $p = \text{n.s.}$). Further, to capture as many unobserved firm-specific characteristics as possible—a further source of potential endogeneity—we use the fixed effects specification. In the model where we test the moderating effect of *Digital sales intensity*, we also instrument the interaction terms between the two instrumental variables and the moderating effect. In order to test for under-, over-identification and weak instruments, we draw on the Kleibergen-Paap, Sargan and Cragg-Donald statistics (Baum, Schaffer, & Stillman, 2003; Wooldridge, 2010). All three statistics are reported at the end of the results tables. These confirm the validity of the chosen instruments. Further, we lag our independent variables by 1 year, while we control for time effects by including year dummies. Finally, to further mitigate any concerns related to the possibility of sample selection omission (i.e., the fact that while some retail firms choose to internationalize, others do not), we apply a Heckman selection model

TABLE 2 Short definition of variables and data sources

Variable	Description	Source
1 ΔID	$\sum P_i \ln(1/P_i)$, where P_i is the percentage of sales in country i ; and $\ln(1/P_i)$ is the particular weight of each country. The final variable is the difference from year $t-1$ to year t .	PlanetRetail
2 $\Delta ID_{\text{digital}}$	$\sum P_{id} \ln(1/P_{id})$, where P_{id} is the percentage of digital sales in country i ; and $\ln(1/P_{id})$ is the particular weight of each country. The final variable is the difference from year $t-1$ to year t .	PlanetRetail
3 $\Delta ID_{\text{physical}}$	$\sum P_{is} \ln(1/P_{is})$, where P_{is} is the percentage of physical (store) sales in country i ; and $\ln(1/P_{is})$ is the particular weight of each country. The final variable is the difference from year $t-1$ to year t .	PlanetRetail
4 ΔPD	$\sum P_j \ln(1/P_j)$, where P_j is the percentage of sales in product category j ; and $\ln(1/P_j)$ is the particular weight of each product category (each retailer's product categorization ranges from 1 to 8 product lines (i.e., grocery; clothing and footwear; electricals and office; food service; health and beauty; home, garden, auto; leisure and entertainment; other). The final variable is the difference from year $t-1$ to year t .	PlanetRetail
5 $\Delta PD_{\text{digital}}$	$\sum P_{jd} \ln(1/P_{jd})$, where P_{jd} is the percentage of digital sales in product category j ; and $\ln(1/P_{jd})$ is the particular weight of each product category. The final variable is the difference from year $t-1$ to year t .	PlanetRetail
6 $\Delta PD_{\text{physical}}$	$\sum P_{js} \ln(1/P_{js})$, where P_{js} is the percentage of physical (store) sales in product category j ; and $\ln(1/P_{js})$ is the particular weight of each product category. The final variable is the difference from year $t-1$ to year t .	PlanetRetail
7 Digital sales intensity	The percentage ratio between a focal firm's digital sales and its total sales	PlanetRetail
8 Size	The natural logarithm of the MNE's total number of assets	Osiris bureau van Dijk
9 Age	The natural logarithm of the difference between the year of observation and the year of inception	Osiris bureau van Dijk
10 Host countries internet penetration	The average number of internet users per 100 people in all foreign countries of operation	World Bank indicators
11 Cultural diversity	The weighted average of cultural distance. Specifically, a weight for the country-specific cultural distance is included as the ratio of the number of outlets in the foreign country over the total number of foreign outlets	Hofstede's cultural dimensions

TABLE 2 (Continued)

Variable	Description	Source
12 Profitability	The percentage ratio between a focal firm's net income and its total assets based on a 3-year average	Osiris bureau van Dijk
13 International experience	The accumulated number of years the focal firm has operated in each different foreign country	PlanetRetail
14 Intangible assets	The percentage ratio between a focal firm's intangible assets and its total assets	Osiris bureau van Dijk
15 Financial leverage	The percentage ratio between a focal firm's debt and its total assets	Osiris bureau van Dijk
16 GDP	The average GDP in all foreign countries of operation (logarithmic transformation is applied)	World Bank indicators

(Heckman, 1979), which corrects for any remaining sample-induced endogeneity. In the two-step Heckman procedure, the original sample is expanded with the inclusion of additional retail firms that have not internationalized in the examined period. The first-stage probit model was estimated with a dummy dependent variable that takes the value 1 if the retail firm has internationalized in the examined time period and 0 otherwise.³ After we obtain the first-stage estimates, we generate the inverse Mills ratio (λ) which accounts for potential self-selection bias. The λ is then added in the second-stage analysis (i.e., the 2SLS fixed effects estimator with instrumental variables). Therefore, our method of analysis, also following extant research, combines a two-stage Heckman selection model with a 2SLS IV model (e.g., He & Chittoor, 2022; Liu, Shao, De Sisto, & Li, 2021).

4 | RESULTS

4.1 | Understanding the empirical context of the study

To better understand the empirical context and sampling of our study, we provide some additional information on the sample characteristics. Overall, firms in our sample have on average a presence in approximately 14 foreign markets, and their profitability and financial leverage are approximately 8.21% and 37.05%, respectively. The average host market internet penetration is 52.21%, while their home market internet penetration is 71.72%, which shows that our sample retail firms originate from relatively digitally-advanced countries. These basic descriptives of our sample provide some preliminary confirmation of the anticipated hypotheses and the importance of the resource bundling perspective. Specifically, our sample retailers seem to be cautious about balancing their product and international diversification strategy, but it is evident that digital channels tend to play an increasingly more important role in this process. Given that the core focus of our research is to identify the contingent role of digital sales intensity on the relationship between product and international diversification, we estimate the level of digital sales intensity across all years of examination (2006–2016) and report the estimates in a two-way plot (Figure 1). This shows that digital sales intensity within this 11-year period has increased by 49.77% (from 4.36% in year 2006 to 6.53% in year 2016). Further, when we examine the 15,976 retailer-host dyads that

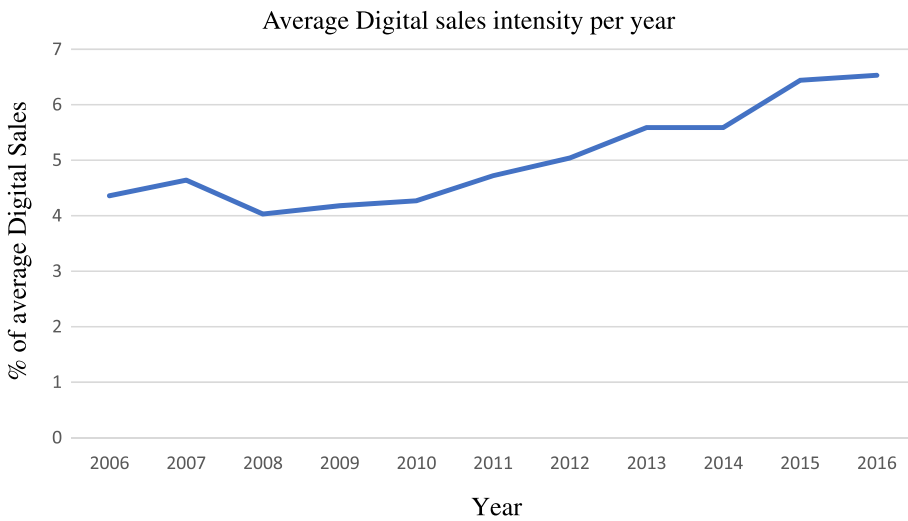


FIGURE 1 Two-way plot of average digital sales intensity per year

we analyzed in our study's sample, 14,515 (90.86%) have only physical sales while 638 (3.99%) have only digital sales. This means that for the vast majority of the dyads, retail firms choose to use only either physical or digital sales, with the former (physical format) being the dominant form of their foreign activity. Further, 823 (5.15%) dyads report both digital sales and physical sales. This shows that physical and digital sales do overlap for a notable part of our sample.

4.2 | Analysis

Correlation coefficients are presented in Table 3. To examine whether there is presence of multicollinearity, we proceed to the estimation of variance inflation factors (VIFs) for each model. The VIF scores provide sufficient evidence to support that multicollinearity is not a concern for our analysis since the highest VIF score does not exceed the threshold of 10.0, which is known as the most common cut-off point for indication of multicollinearity (Hair, Anderson, Tatham, & William, 1998).

To test our hypotheses, we rely on the second-stage estimates of the generalized 2SLS fixed-effects IV regression (Table 4 and Table 5). The reported estimates are standardized coefficients. Model 1 (Table 4) examines our baseline hypothesis, that is whether a negative relationship exists between ΔPD and ΔID . According to our estimates, the aforementioned relationship is negative and statistically significant ($\beta = -0.113$; $p = .003$), which is consistent with the baseline hypothesis. We thus confirm that ΔPD and ΔID are negatively related.

Model 2 (Table 4) examines the moderating effect of *Digital sales intensity* on the relationship between ΔPD and ΔID . The coefficient of the interaction term between ΔPD and *Digital sales intensity* is found to be positive and statistically significant ($\beta = 0.105$; $p = .013$) thus verifying that digital sales do alleviate the negative effect of product diversification growth on international diversification growth. Therefore, Hypothesis (H1) is confirmed. In terms of effect size, this result indicates that a one standard deviation increase in ΔPD is associated with a ΔID increase of 0.105, for retail MNEs with high digital sales intensity compared to retail MNEs with



TABLE 3 Pairwise correlations and descriptive statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 ΔID	1.00															
2 ΔID _{digital}	0.12	1.00														
3 ΔID _{physical}	0.20	0.14	1.00													
4 ΔPD	-0.04	0.13	-0.04	1.00												
5 ΔPD _{digital}	0.07	0.20	-0.01	0.28	1.00											
6 ΔPD _{physical}	-0.03	0.09	-0.05	0.89	0.13	1.00										
7 Digital sales intensity	-0.01	0.05	0.05	0.07	0.05	-0.03	1.00									
8 Size	0.01	0.10	-0.01	0.03	0.08	-0.01	0.16	1.00								
9 Age	-0.07	-0.02	-0.08	0.03	0.04	0.00	-0.05	0.17	1.00							
10 Host countries internet penetration	-0.04	-0.01	-0.02	-0.01	0.00	-0.03	0.33	0.16	-0.05	1.00						
11 Cultural diversity	0.00	0.05	0.00	-0.05	0.04	-0.03	-0.12	0.17	0.00	0.03	1.00					
12 Profitability	0.02	-0.01	0.01	0.01	0.01	0.00	0.13	0.11	-0.02	0.07	0.00	1.00				
13 International experience	-0.08	0.00	-0.09	-0.05	0.00	-0.04	0.06	0.17	-0.05	0.14	0.11	0.25	1.00			
14 Intangible assets	0.00	0.00	0.06	0.00	-0.01	-0.03	0.12	0.07	-0.24	0.10	-0.07	-0.06	0.11	1.00		
15 Leverage	0.01	0.01	0.02	0.01	0.00	0.01	0.06	0.01	0.09	0.01	-0.06	0.02	-0.22	-0.04	1.00	
16 GDP	-0.01	0.01	-0.01	-0.06	0.01	-0.07	0.21	0.35	-0.12	0.35	0.20	0.08	0.08	0.00	-0.15	1.00
Mean	0.03	0.01	0.03	0.01	0.01	0.00	4.42	15.30	3.39	52.22	1.75	6.18	86.72	14.39	37.05	28.67
Std. dev.	0.10	0.09	0.10	0.06	0.06	0.06	8.82	1.57	0.95	21.98	1.09	8.21	148.71	15.69	34.55	1.73
Min	-0.49	-0.58	-0.51	-0.58	-0.46	-0.65	0.00	9.07	0.00	1.83	0.00	-77.90	0.00	0.00	-307.17	22.41
Max	0.67	1.10	0.68	0.59	0.69	0.58	55.70	19.59	5.85	92.31	4.20	48.62	1.174.00	77.03	87.46	30.56

Note: Correlation coefficients above |0.06| are significant at the 5% level.

TABLE 4 IV 2SLS fixed effects regression estimates on international diversification

	Model 1		Model 2	
	Coef. (s.e.)	<i>p</i> -val	Coef. (s.e.)	<i>p</i> -val
Δ PD	-0.113 (0.041)	<i>.003</i>	-0.182 (0.051)	<i>.000</i>
Digital sales intensity	-0.107 (0.085)	<i>.210</i>	-0.131 (0.086)	<i>.129</i>
Δ PD \times digital sales intensity (H1)			0.105 (0.047)	<i>.013</i>
Size	-0.019 (0.200)	<i>.925</i>	0.019 (0.202)	<i>.927</i>
Age	-0.418 (0.154)	<i>.007</i>	-0.430 (0.155)	<i>.006</i>
Host countries internet penetration	-0.067 (0.081)	<i>.408</i>	-0.055 (0.081)	<i>.499</i>
Cultural diversity	-0.171 (0.104)	<i>.098</i>	-0.161 (0.104)	<i>.122</i>
Profitability	-0.039 (0.042)	<i>.352</i>	-0.036 (0.042)	<i>.400</i>
International experience	-0.144 (0.068)	<i>.036</i>	-0.141 (0.069)	<i>.039</i>
Intangible assets	0.012 (0.087)	<i>.888</i>	0.010 (0.087)	<i>.905</i>
Leverage	0.111 (0.115)	<i>.336</i>	0.131 (0.116)	<i>.260</i>
GDP	1.198 (0.367)	<i>.001</i>	1.166 (0.368)	<i>.002</i>
Inverse Mills ratio (λ)	0.231 (0.167)	<i>.167</i>	0.265 (0.168)	<i>.115</i>
Year FE	Yes		Yes	
Sector FE	Yes		Yes	
Observations	1.029		1.029	
R-squared	0.106		0.112	
Number of firms	122		122	
Anderson canonical correlation LM statistic (<i>p</i> -value)	0.000		0.000	
Cragg-Donald Wald F statistic	503.772		230.898	
Sargan statistic (<i>p</i> -value)	0.546		0.187	

Note: Standardized coefficients are reported; Standard errors are reported in parentheses; *p*-values are reported in italics; one-tailed tests for independent variables; two-tailed tests for controls; Independent and control variables are lagged 1 year; In model 1 we use lagged Δ PD and lagged PD to instrument Δ PD. In model 2 we use lagged Δ PD, lagged PD, lagged Δ PD \times Digital sales intensity, lagged PD \times Digital sales intensity to instrument Δ PD and Δ PD \times Digital sales intensity.



TABLE 5 IV 2SLS fixed effects regression estimates on international diversification / international diversification digital / international diversification physical

Dependent variable	Model 3		Model 4		Model 5	
	Δ international diversification		Δ international diversification digital		Δ international diversification physical	
	Coef. (s.e.)	<i>p-val</i>	Coef. (s.e.)	<i>p-val</i>	Coef. (s.e.)	<i>p-val</i>
$\Delta PD_{\text{digital}}$ (H2)	0.115 (0.037)	<i>.001</i>	0.071 (0.041)	<i>.044</i>	0.121 (0.037)	<i>.001</i>
$\Delta PD_{\text{physical}}$ (H3)	-0.133 (0.041)	<i>.001</i>	-0.059 (0.045)	<i>.093</i>	-0.150 (0.041)	<i>.000</i>
Size	-0.043 (0.196)	<i>.825</i>	0.072 (0.218)	<i>.741</i>	0.034 (0.196)	<i>.864</i>
Age	-0.457 (0.152)	<i>.003</i>	-0.403 (0.169)	<i>.017</i>	-0.477 (0.153)	<i>.002</i>
Host countries internet penetration	-0.089 (0.080)	<i>.264</i>	0.064 (0.088)	<i>.473</i>	-0.072 (0.080)	<i>.368</i>
Cultural diversity	-0.142 (0.102)	<i>.163</i>	-0.139 (0.113)	<i>.220</i>	-0.136 (0.102)	<i>.184</i>
Profitability	-0.051 (0.042)	<i>.223</i>	0.003 (0.047)	<i>.950</i>	-0.033 (0.042)	<i>.430</i>
International experience	-0.147 (0.068)	<i>.031</i>	-0.139 (0.076)	<i>.065</i>	-0.146 (0.068)	<i>.033</i>
Intangible assets	0.008 (0.086)	<i>.925</i>	-0.230 (0.096)	<i>.016</i>	0.041 (0.086)	<i>.633</i>
Leverage	0.069 (0.114)	<i>.547</i>	-0.097 (0.127)	<i>.445</i>	0.128 (0.114)	<i>.263</i>
GDP	1.226 (0.364)	<i>.001</i>	0.261 (0.404)	<i>.517</i>	1.170 (0.364)	<i>.001</i>
Inverse Mills ratio (λ)	0.174 (0.164)	<i>.290</i>	-0.159 (0.182)	<i>.382</i>	0.260 (0.164)	<i>.114</i>
Observations	1.029		1.029		1.029	
R-squared	0.116		0.062		0.100	
Number of firms	122		122		122	
Anderson canonical correlation LM statistic (<i>p</i> -value)	0.000		0.000		0.000	
Cragg-Donald Wald F statistic	253.407		253.407		253.407	
Sargan statistic (<i>p</i> -value)	0.914		0.110		0.708	

Note: Standardized coefficients are reported; Standard errors are reported in parentheses; *p*-values are reported in italics; one-tailed tests; Independent and control variables are lagged 1 year; We use lagged $\Delta PD_{\text{digital}}$ and lagged PD_{digital} to instrument $\Delta PD_{\text{digital}}$ as well as lagged $\Delta PD_{\text{physical}}$ and lagged PD_{physical} to instrument $\Delta PD_{\text{physical}}$.

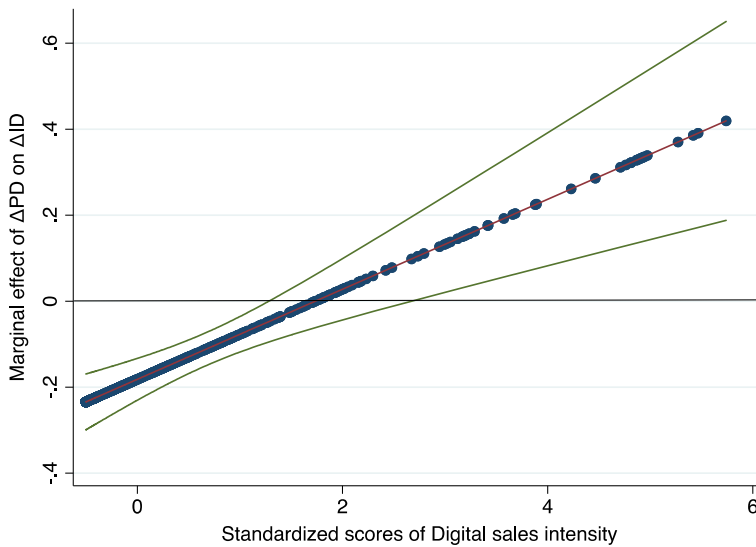


FIGURE 2 The moderating effect of digital sales intensity on the relationship between ΔPD and ΔID (model 2)

low digital sales intensity. Figure 2 shows the marginal effect plot with 95% confidence intervals (Meyer, van Witteloostuijn, & Beugelsdijk, 2017) for the moderating effect of *Digital sales intensity*. The plot depicts that *Digital sales intensity* has a significant and positive (alleviating) effect on the relationship between ΔPD and ΔID .

In Models 3–5 (Table 5) we examine whether digital and physical product diversification growth can deliver contrasting (positive vs. negative) effects against international diversification growth (total, digital and physical) for the diversifying retail MNEs. Specifically, Model 3 examines the relationship between $\Delta PD_{digital}$ and ΔID as well as this between $\Delta PD_{physical}$ and ΔID . The coefficient of $\Delta PD_{digital}$ is found to be positive and statistically significant ($\beta = 0.115$; $p = .001$), thus confirming that product diversification growth through digital channels has a significantly positive effect on a retail firm's international diversification growth. However, the coefficient of $\Delta PD_{physical}$ is found to be negative and statistically significant ($\beta = -0.133$; $p = .001$), a result that confirms that product diversification growth through physical channels has a significantly negative effect on a retail firm's international diversification growth. Further, we decompose our dependent variable (i.e., ΔID) to $\Delta ID_{digital}$ and $\Delta ID_{physical}$ aiming at providing a more nuanced understanding to the previously discussed effects. Specifically, Model 4 assesses the effect of $\Delta PD_{digital}$ and $\Delta PD_{physical}$ on $\Delta ID_{digital}$. The coefficient of $\Delta PD_{digital}$ is found to be positive and statistically significant ($\beta = 0.071$; $p = .044$), while the coefficient of $\Delta PD_{physical}$ is found to be negative and statistically significant ($\beta = -0.059$; $p = .093$), thus confirming that (a) product diversification growth through digital channels has a positive effect on a retail firm's international diversification growth through digital channels and (b) product diversification through physical channels negatively affects a retail firm's international diversification growth through digital channels. Finally, Model 5 examines the effect of $\Delta PD_{digital}$ and $\Delta PD_{physical}$ on $\Delta ID_{physical}$. The coefficient of $\Delta PD_{digital}$ is found to be positive and statistically significant ($\beta = 0.121$; $p = .001$), while the coefficient of $\Delta PD_{physical}$ is found to be negative and statistically significant ($\beta = -0.150$; $p = .000$). The aforementioned results prove that (a) product diversification growth through digital channels has a positive effect on a retail firm's international diversification growth through physical channels and (b) product diversification growth



through physical channels negatively relates to a retail firm's international diversification growth through physical channels. These results validate Hypothesis (H2) and Hypothesis (H3).

5 | DISCUSSION AND CONCLUSIONS

Our study is motivated by the previously conflicting findings of the relationship between product and international diversification. While past research advocated for a negative relationship (Kumar, 2009), more recent developments argue for contingency effects that may turn this relationship from negative to positive (Bowen & Sleuwaegen, 2017). While our findings do confirm the long-standing view, which supports a negative relationship between product and international diversification in physical retail channels, by separately examining diversification in physical and digital channels, we are able to gain more insight and highlight the important role of digital sales intensity in modern IB research.

Overall, the confirmation of Hypothesis (H1) shows that going digital retail firms which increase their commitment towards a digital sales strategy are more capable in weathering the demands of simultaneous growth in product and international diversification. This finding resonates with the resource bundling perspective which suggests that going digital internationalizing firms need to bundle digital assets with their non-digital resources (conventional resources) in order to successfully internationalize their activities (Hennart, 2009; Verbeke & Hutzschenreuter, 2020). The confirmation of Hypothesis (H2) reveals that the widening of their product portfolio in digital channels positively relates with growth in total international diversification but also with international diversification growth in both physical and digital channels. This finding reinforces the view that going digital firms which increasingly invest in digital channels are more likely to offset the relatively higher costs of simultaneously diversifying their product and international growth strategy. Our findings are in line with recent research stressing the benefits of expanding internationally through digital channels, due to their advantages in terms of speed of entry, simultaneous presence in multiple markets, wide expansion, etc. (Luo, Zhao, & Du, 2005; Vadana, Torkkeli, Kuivalainen, & Saarenketo, 2019).

On the contrary, the confirmation of Hypothesis (H3) demonstrates that widening a going digital retail MNE's physical product portfolio will result in pressures and costs incurred in terms of total international diversification but also in international diversification within physical and digital channels (total-physical-digital). This negative relationship between physical product diversification growth and international diversification growth shows that going digital retail firms that have been in the process of increasing their physical footprint are more likely to incur greater costs when simultaneously growing their international diversification in both digital and physical channels. This suggests that increasing investment in physical channel product portfolio in a going digital retail MNE increases the costs associated with simultaneous international expansion in both digital and physical channels. The confirmation of both Hypothesis (H2) and Hypothesis (H3) highlights the increasing importance of the bundling perspective for going digital retailers, that is, the view that firms need to aim for a multichannel strategy (engaging in both digital and physical channels) when it comes to establishing their two most important growth strategies—product and international diversification.

Our study offers several theoretical contributions. First, we add to the wider diversification strategy literature through offering a new perspective on how going digital internationalizing firms could turn the costs of adopting a potentially resource-demanding product and

international diversification strategy into a more efficient strategy by bundling digital channels. Although extant research has provided very useful insights with regards to the contingencies of the negative effect between product and international diversification strategies (Hashai & Delios, 2012; Mayer et al., 2015; Ref, 2015), we still know very little on what it really takes for a firm to simultaneously apply these two strategies. Our study's focus on digital sales channels facilitates the aforementioned discussion on the costs versus benefits characterizing product and international diversification, allowing us to reconcile previously monotonically negative findings.

Second, our study innovates by separately examining product and international diversification in physical and digital channels. In this manner we further refine the rapidly growing research stream of integrating digitalization in the IB and corporate strategy literature (Banalieva & Dhanaraj, 2019; Monaghan et al., 2020; Stallkamp & Schotter, 2021). The aforementioned distinction demonstrates that considering digital channels in an IB context is an increasingly important contingency for market-seeking internationalizing firms as it may challenge previously established relationships.

Third, our study contributes to the product diversification–international diversification tenet by utilizing the relevant and more contemporary theoretical perspective of resource bundling (Hennart, 2009). We thus enrich the theoretical synthesis of the examination of the product diversification–international diversification relationship via theorizing and drawing arguments from a relatively unexplored theoretical tenet in the IB literature. In addition, we contribute to the advancement and further application of the resource bundling perspective in the wider IB literature (Hennart, 2009; Verbeke & Kano, 2016). More specifically, while there has been a call for a more careful examination of the pros and cons when bundling digital assets in the internationalization process (Verbeke & Hutzschenreuter, 2020), our findings do indicate that the bundling of digital assets does indeed benefit the simultaneous product and international diversification.

Our study's theoretical predictions and findings offer interesting insights for managers and practitioners. First, our focus on going digital (instead on born digital) firms provides suggestions to managers who lead the growth and digital transformation of the many going digital firms that are contemplating about their level of commitment towards embracing digital channels. Second, remaining traditional, that is largely relying on a physical growth strategy and not transforming digitally, will automatically lead firms to an unfavorable position suffering from the well-known constraints attributed to limited managerial resources and other resource bottlenecks. Depending on their idiosyncratic characteristics, going digital firms can strategically decide about the right mix between product and international diversification, which in turn, can help them largely offset the negative consequences of solely relying on digital or physical activities, as mentioned above. Third, managers need to be cautious of the costs associated with increasing their firms' physical channel product portfolio in as these may harm, not only the growth of international diversification in physical channels, but also their international expansion in digital channels. This suggests that there are benefits in increasing a going digital firm's digital channel product portfolio while remaining prudent in its physical channel product portfolio growth. Fourth, since our findings reveal that digital channels play an increasingly important role for the international growth of retail firms, policies supporting the adoption of e-commerce strategies (e.g., training programs for the development of digital skills, easier access to finance for firms to develop digital competences, etc.) can help traditional retailers and especially SMEs to overcome the trade-off between product diversification and international diversification arising from resource constraints.⁴



Several limitations of this study deserve discussion. First, our sample is limited to going digital retail firms, and although the focus on this sector allows us to be more specific in terms of the arguments leading to each hypothesis, at the same time we cannot make wider assumptions about the applicability of our findings in other contexts. Future research should attempt to assess the effect of digitalization in general and digital sales channels, in particular, on the relationship between product and international diversification in other, more vertically-integrated industries and sectors. Second, another limitation is that our focus with regards to embracing digital channels is solely based on retailers with a market-seeking expansion strategy, and as such, we could not assess other forms of digital intensity across the firm's global value chain that might be equally important in assessing the latter's effect on the relationship between product and international diversification. Third, due to unavailability of more relevant data, our analysis does not include more detailed information on e-commerce, such as whether digital sales take place through retailers' own platforms or through third party e-commerce platforms. Given the possibility that a number of international or digital sales activities might be externalized to third party e-commerce platforms as a way to offset the lack of resources and capabilities within firms, controlling for such a governance mode would offer even more refined insights to the literature. Finally, our study focuses on going digital – born physical retail MNEs and excludes born digitals, a particularly dynamic and important group of firms. Although retail firms under this group (e.g., JD, Alibaba, Amazon) have gradually started adopting a multichannel approach in their growth strategy by bundling physical channels (Grewal et al., 2021), unfortunately due to limited observations, we are not in a position to include born digital retail firms in our analysis. We therefore call for future research studies to provide empirical insights on that direction.

In conclusion, by separately examining product and international diversification in physical and digital channels, we add a new layer of knowledge in the rapidly advancing research stream embracing digitalization in IB (Banalieva & Dhanaraj, 2019; Brouthers et al., 2016; Chen et al., 2019; Li et al., 2019; Monaghan et al., 2020; Ojala et al., 2018). Based on this perspective, our findings do suggest that digital sales intensity does alter basic assumptions about the nature of firm-specific competences and their potential limitations. In this sense, we find that when firms can successfully orchestrate a multichannel approach, they can realize benefits in their diversification strategies. Our study shows that the incorporation of digital channels can indeed add substantial value to the firm in the sense that product and international growth strategies can be seen as mutually beneficial for the retail MNE. We claim this to be the first study in the IB literature to make such a fine distinction in this traditionally important research question through clearly demonstrating the benefits of adopting a multichannel strategy in the context of corporate diversification.

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ENDNOTES

¹ E-business and digitalization are terms usually linked to the use of the internet to conduct or support business activities along the value chain (Amit & Zott, 2001). In this paper, we focus on market-seeking digital sales activities of going digital firms, and we do not claim that we touch upon all digital aspects of the global value chain. However, we acknowledge that global value chain activities for digital firms have a much broader scope also including operations, logistics, infrastructure, human resources, and finance, among others (Brynjolfsson & Kahin, 2002).

- ² As a robustness test, and considering that the PD - ID relationship can be simultaneously determined, we also apply a 3SLS model. Even though an optimal procedure for testing simultaneity / reverse causality, 3SLS can be estimated in STATA only with the `reg3` command, that is a procedure facilitating single-level analysis only. It is, therefore, not very appropriate in our study, which is based on longitudinal panel data (Zoogah, 2018). For that reason, we proceed with the implementation of a 3SLS in a pooled formation. The 3SLS findings confirm the results of the 2SLS fixed effects regression estimates we report later in the results section. The 3SLS results suggest that the causality runs from product diversification to international diversification and not the other way around (see supplementary file, TABLE S1). As a result, simultaneity / reverse causality is not established.
- ³ We include mobile phone users and the level of consumer price index in the home country in the first-stage regression as our exclusion restrictions. We consider that both variables can influence the internationalization decision of a firm. First, mobile phone users at home denote the presence of advanced digital infrastructure in the home country which is known to facilitate the internationalization of firms (Brieger et al., 2022; Deng, Zhu, Johanson, & Hilmersson, 2022). Further, consumer price index in the home country has been shown to decrease internationalization, as an increase in the price index reduces internationalizing firms' competitiveness and foreign exchange earnings (Kotler, Manrai, Lascu, & Manrai, 2019). At the same time, the decision to internationalize is not the same with the level of growth / geographic diversification across foreign markets. We consider that the latter is a strategy that mainly relates to firm-specific capabilities and host country characteristics and does not directly relate to the exclusion restrictions above. The results of the first-stage regression are available from the authors upon request.
- ⁴ We would to thank an anonymous reviewer for making this suggestion.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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