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Moderating influence of product diversification on the international diversification-performance relationship: A meta-analysis

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ABSTRACT

Numerous studies have examined the impact of international diversification on firm performance. However, the literature is characterised by inconsistent findings, suggesting the need for a quantitative review and synthesis of the hypothesised relationships. Using a sample of 263 effect sizes from 187 primary studies between 1974 and 2021, we conduct a meta-analysis to test the relationship between international diversification and firm performance, and the moderating effect of product diversification. The results of our meta-analysis indicate that the relationship between international diversification and firm performance is non-linear inverted U-shaped. Furthermore, we find that performance is higher in firms with low/related product diversity and lower in firms with high/unrelated product diversity, suggesting that the dual-diversification strategy is detrimental to firm performance. Although there is no significant difference in the performance of firms from advanced and emerging economies, the results highlight the importance of intangible assets for diversified firms.

1. Introduction

International diversification represents the extent to which firms undertake value-adding activities in foreign markets (Hennart, 2007). Over the past several decades, a thriving body of literature has attempted to ascertain the nature and shape of the international diversification-performance (ID-P) relationship. Scholars have explored the topic using various theoretical approaches, such as market power theory (Grant, 1987), transaction cost theory (Tallman & Li, 1996), portfolio theory (Denis, Denis, & Yost, 2002), organisational learning theory (Ruigrok & Wagner, 2003), institution-based view (Delios, Xu, & Beamish, 2008), and the Uppsala model of internationalisation (Almodóvar & Rugman, 2014). Despite the large number of studies, the literature remains divided on the nature of the relationship between international diversification and firm performance.

Different arguments on the ID-P relationship have emerged over the years. Early studies focused on the risk reduction aspect of internationalisation, and a central theme within this literature is that investment in uncorrelated economies reduces the risk of market failure. Thus, firms with higher foreign operations among the total operations earn stable earnings compared to firms with lower foreign operations (Kim, Hwang, & Burgers, 1993; Rugman, 1976). Next, international diversification allows firms to spread their fixed costs over a wider scope, standardise production and amortise investment in R&D, thereby achieving economies of scale (Hitt, Hoskisson, & Kim, 1997; Kobrin, 1991). Some studies have argued that firms with a wider geographic scope are able to increase profitability by tapping the arbitrage arising from uneven economic development of nations (Ghemawat, 2001; Porter, 1990). Others have suggested that learning is an increasing function of internationalisation and exposure to diverse environments contributes positively to the development of knowledge and intangible assets of the firm, which aids in scanning for new market opportunities (Contractor, Kundu, & Hsu, 2003). As evident from these arguments, there are different theoretical perspectives on the ID-P relationship.

Palich, Cardinal, and Miller (2000) used a three-stage identification process to classify a research field as mature: first, a substantial number of empirical studies have been conducted; second, the results are reasonably consistent and generalisable; and third, the research has led to a general consensus regarding the key relationships. Thus, it is safe to classify the literature on the ID-P relationship as immature because it is characterised by an ongoing debate concerning the nature of the relationship. No less than four different relationships have been suggested: positive (Delios et al., 2008; Grant, 1987; Zahra, Ireland, & Hitt, 2000), negative (Chang & Wang, 2007; Riahi-Belkaoui, 2003), curvilinear (Gaur & Kumar, 2009; Ruigrok & Wagner, 2003), and no direct relationship (2011; Hennart, 2007). The nature of the curvilinear

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relationship is characterised by further dispute. Therefore, U-shaped (Capar & Kotabe, 2003; Contractor, Kumar, & Kundu, 2007), inverted U-shaped (Borda, Geleilate, Newburry, & Kundu, 2017; Grant, Jammine, & Thomas, 1988), S-shaped (Lu & Beamish, 2004; Ruigrok, Amann, & Wagner, 2007), and, more recently, M−shaped (Almodóvar & Rugman, 2014; Mendoza, Espinosa-Méndez, & Araya-Castillo, 2019) and W-shaped (Zhou, 2018) relationships have been suggested. Evidently, the literature is far from reaching a consensus.

Another issue that persists in the literature is the moderation effect of product diversification on the ID-P relationship. While product diversification has been suggested to have a positive effect on firm performance because it provides opportunities to achieve synergies (Michael Geringer, Beamish, & Dacosta, 1989; Hitt et al., 1997), the literature has been divided on the combined effects of international and product diversification. On the one hand, studies have suggested that an integrated product-international diversification strategy yields stable returns because it reduces variance exposure (Kim et al., 1993). On the other hand, management complexities and costs of governance increase substantially as firms venture into new product segments and geographic domains (Qian, 2002; Tallman & Li, 1996). Thus, the literature again falls short of reaching a consensus.

To address these inconsistencies, our primary goal is to ascertain the nature of the ID-P relationship by conducting a *meta*-analysis of 187 primary studies. Our second goal is to test the nature of the ID-P relationship under the moderation effect of product diversification. We argue that the inconsistencies in the literature are attributable to the different theoretical approaches, sample locations, and firm-level characteristics, such as size and intangible assets. Our approach is both theoretically and empirically driven. Theoretically, we draw upon the internalisation/transaction cost theory and the knowledge/resource-based view. This approach provides the scope for exploring and comparing various views posited by the ID-P literature, such as flexibility/risk reduction (Kim et al., 1993; Rugman, 1976), economies of scale (Grant et al., 1988; Hitt et al., 1997; Miller, Lavie, & Delios, 2016), learning effects (Contractor et al., 2003; Lu & Beamish, 2001), and governance costs (Chang & Wang, 2007). In addition, integrating the views from the aforementioned theories allows us to conduct an in-depth examination of the interaction between international and product diversification. Specifically, we emphasise that the interrelatedness between knowledge acquired through international and product diversification allows firms to achieve synergies. Thus, firms are able to achieve higher performance through a dual diversification strategy.

Empirically, we use *meta*-analytical techniques to integrate the distorted findings from existing studies to reveal underlying relationships and hidden moderation effects (Hunter & Schmidt, 1990). Buckley, Devinney, and Tang (2014) argue that this feature of *meta*-analysis is particularly useful in the field of international business, where samples are based on the availability of data from different countries at different points in time. Our *meta*-analytical tests include linear relationships as well as all previously proposed curvilinear ID-P relationships (e.g., U-, inverted U-, S-, M-, and W-shaped relationships) more than any other *meta*-analytical study on the topic (Bausch & Krist, 2007; Yang & Driffield, 2012), thus adding novelty to our work. The remainder of the paper is structured as follows. In the following section, we discuss the theory and frame our hypotheses. Next, we explain the methods employed to conduct the *meta*-analysis. Subsequently, we discuss the results before providing concluding remarks.

2. Theory and hypotheses

The ID-P relationship has been explored using several theoretical lenses. In a broader sense, the literature has evolved along two distinct arguments (Hennart, 2007). First, international diversification has been argued to offer operational flexibility and risk reduction incentives. From a portfolio theory perspective, Rugman (1976) argues that firms are able to reduce the variance in their earnings by spreading their operations across various countries as long as the economies of the countries are not perfectly correlated. Thus, the stability of earnings is an increasing function of international diversification. Similarly, the real options theory suggests that geographically dispersed foreign subsidiaries offer the option to switch production when uncertainty occurs in a country (Kogut & Kulatilaka, 1994; Tang & Tikoo, 1999).

Second, international diversification has been argued to increase profitability and firm performance by offering scale economies, and access to wider resources and market opportunities. Firms are able to achieve scale economies by spreading common and centralised expenses over a wider geographic scope (Hitt et al., 1997). Thus, internationally diversified firms should be more profitable than their domestic counterparts. From a resource-based perspective, profitability through international diversification has been linked to access to resources. For example, Contractor et al. (2003) argue that internationally diversified firms are able to access cheap labour, natural resources and advanced technologies. Similarly, Chen and Tan (2012) argue that international diversification allows firms to acquire unique resources and overcome domestic constraints, thus giving them a competitive advantage. The learning theory suggests that firms operating in multiple markets simultaneously are able to absorb new knowledge and seek better opportunities that may otherwise be unavailable to less diversified firms (Hitt et al., 1997). Furthermore, a wider geographic scope also allows firms to switch production and sales from less profitable markets to more profitable ones (Thomas & Eden, 2004).

However, these arguments have been contradicted. The transaction cost theory challenges both the risk reduction and profit maximisation arguments. First, the transaction cost theory suggests that firms choose to invest in countries that are culturally and economically related. Thus, the risk reduction benefits are not fully materialised unless the firm chooses to diversify across different product segments (Hennart, 2007). Second, Hennart (2007) argues that profits can be maximised from investments made in fewer countries provided the firm is capable of tapping a market sufficiently large to achieve scale economies. Some scholars have argued that performance is an inverse function of international diversification because of the liability of foreignness (Denis et al., 2002; Lu & Beamish, 2001). Related to the liability of foreignness argument, others have argued that cross-national differences increase the costs of integration and coordination and decrease firm performance (Patel, Criaco, & Naldi, 2018). From a cultural distance perspective, Ruigrok and Wagner (2003) argue that performance decreases with an increase in international diversification because expansion into culturally unrelated environments creates an imbalance between internal competencies and the external environment.

Over time, the ID-P literature has evolved from simple linear relationships to more complex non-linear relationships by combining the aforementioned arguments and theoretical perspectives. For instance, Grant (1987) and Hitt et al. (1997) use the scale economies and governance costs arguments to posit an inverted U-shaped relationship such that higher performance from international diversification results from efficient resource allocation decisions. However, performance decreases at higher levels of international diversification because of the increase in administrative and coordination costs. Some scholars have argued that the ID-P curve displays a U-shaped relationship rather than an inverted U-shaped relationship. According to this stream of research, performance decreases during the initial stages of international diversification due to the liability of foreignness (Lu & Beamish, 2001), cross-national differences (Ruigrok & Wagner, 2003) and the inability of firms to manage start-up costs (Miller et al., 2016). However, performance gradually increases as the learning effect kicks in and firms are able to obtain scale economies. Building on U- and inverted U-shaped relationships, recent studies have managed to develop more complex sigmoid S-shaped and quartic M- and W-shaped relationships. We summarise the various ID-P relationships and the different theoretical arguments in Table 1.

2.1. International diversification and firm performance

As noted above, the relationship between international diversification and firm performance is complex. In this section, we formulate preliminary hypotheses to guide our *meta*-analysis. The extant literature attributes the positive impact of international diversification on performance to the possibility of internalising ownership advantages over a wider scope, exploiting market imperfections and extracting arbitrage from uneven economic growth, risk diversification, economies of scale, and access to knowledge resources.

First, multinationality is an efficient organisation structure to transfer and exploit various firm-specific advantages (2001; Dunning, 1980; Kirca et al., 2011) and internalise market imperfections (2009; Buckley & Casson, 1976; Rugman, 1976). Firm-specific advantages, which include intangible assets, patents, technological know-how, brand names, trademarks, and various managerial and organisational skills, have a tendency to extract monopoly rents for their owners. Such assets are usually difficult to sell and are not location-bound (Verbeke, Li, & Goerzen, 2009). It is more advantageous for firms to exploit such resources in external markets by internalising market imperfections (Morck & Yeung, 1991). Kirca, Roth, Hult, and Cavusgil (2012) argue that the value of intangible assets is enhanced in direct proportion to the degree of international diversification. Thus, a firm with a wider geographic scope is able to exploit more market imperfections and attain benefits of internalising the ownership advantages, which indicates that internationally diversified firms are likely to extract higher returns on investment than domestic firms. In addition to exploiting market imperfections, a wider geographic scope increases the potential of extracting arbitrage (Contractor et al., 2003). Firms with their operations spread across different economies are able to reap the benefits of country-specific resources, such as low labour costs, better technology, or unique natural resources (Ghemawat, 2001; Kobrin, 1991; Porter, 1990).

Second, flexibility imparted by international diversification allows the firm to maintain steady performance growth by shifting production to favourable environments when uncertainty occurs in a particular country (Kim et al., 1993; Verbeke et al., 2009). For instance, operating in one country may be riskier than operating in others, and multicountry investments serve as a buffer should the environment of one country turn unfavourable. Similarly, by investing in countries whose economies are not integrated or correlated, the overall operations of the firm are not affected if the economy of one country goes into decline (Shapiro, 1978). Therefore, international diversification imparts flexibility to the firm to respond to changes in the external environment (Denis et al., 2002). While this flexibility might not have a direct effect on firm profitability, it does leave the firm with an option to reduce its losses or to maintain stable earnings (Belderbos & Zou, 2009; Kogut & Kulatilaka, 1994; Rugman, 1976).

Third, it has been argued that international diversification increases profitability through scale economies. A wider geographic scope permits the firm to standardise products, streamline production, and coordinate R&D activities (Hitt et al., 1997; Kobrin, 1991). Through these activities, the firm is able to achieve scale economies and increase returns on fixed costs. In a similar vein, Contractor et al. (2003) posit that the advantages of international diversification accrue from the possibility of spreading the central costs across nations. Thus, firms with a wider geographic scope are able to achieve scale economies and increase profitability.

Fourth, international diversification allows the firm to increase its knowledge resources. The expansion of firms beyond their national borders after acquiring essential knowledge about foreign markets has been a central theme in the internationalisation literature (Johanson & Vahlne, 1977, 2009). International expansion aids this process by enhancing the firm's knowledge base through experiential learning (Autio, Sapienza, & Almeida, 2000; Vermeulen & Barkema, 2001). Moreover, exposure to diverse environments stimulates firms to develop diverse capabilities (Kim et al., 1993). Similarly, a wider geographic scope allows the firm to observe competition trends and identify new market opportunities (Contractor et al., 2003).

While international diversification does accrue benefits, evidence has suggested that performance declines with an increase in geographic scope. The transaction cost theory suggests that high levels of international operation generally increase governance costs (Williamson, 1985). Foreign investments are asset-specific, location-specific, and irreversible (Li & Rugman, 2007; Williamson, 1985). Because irreversible investments represent sunk costs (O'Brien & Folta, 2009), the amounts invested previously are non-recoverable; thus, new investments would require commitment of additional resources.

Internationally diversified firms have to deal with an assortment of institutional and cultural challenges. Institutional theorists argue that cross-border expansion increases the difficulties of establishing organisational legitimacy (Kostova & Zaheer, 1999; Zaheer, 1995). Applying this logic, the more internationally diversified a firm is, the more challenges it will face in establishing legitimacy in different countries. Evidence also suggests that cultural distance between nations has a detrimental effect on firm and subsidiary performance (Beugelsdijk, Kostova, Kunst, Spadafora, & van Essen, 2018; Luo & Peng, 1999). Hennart (2007) argues that the cost of governance increases significantly with cultural distance because with an increase in distance, firms need additional knowledge to direct their actions effectively. Therefore, becoming acquainted with new cultures is an important step towards improving performance in a foreign country (Dhanaraj & Beamish, 2009) and necessitates that firms familiarise themselves with the new cultural environment, a process that consumes additional resources.

International diversification represents the spatial expansion of the firm across its domestic borders into new countries (Hitt et al., 1997), and over-diversification is subject to risks of regional and geographical diversity. Regional differences and the increased costs of coordinating geographically dispersed operations can potentially negate the benefits that arise from multinationality (Michael Geringer et al., 1989). Investing in a geographically distant country adds logistical costs and generally requires additional labour to manage the supply chain. Moreover, excessive international diversification means handling matters with clients and suppliers from different physical domains and cultural and linguistic backgrounds, which in turn impose restrictions and constraints on the strategies of the firm (Feely & Harzing, 2003; Grinblatt & Keloharju, 2001; Siddharthan & Lall, 1982).

As noted, the benefits and costs associated with international diversification accrue at different stages of internationalisation. To guide our research, we formulate the following hypothesis by reconciling the aforementioned theoretical arguments.

Hypothesis 1. The relationship between international diversification and firm performance is non-linear inverted U-shaped.

2.2. Moderating influence of product diversification

Product diversification refers to the expansion of firms into related and unrelated product segments (Michael Geringer et al., 1989; Qian, 2002) or into vertical and horizontal segments (Qian, 1997; Tsang & Yip, 2007; Zhao & Luo, 2002). While international and product diversification coexist in an international business context, the interaction between the two is complex and the extant literature has provided competing views on their combined effect on firm performance.

One view argues that firms exploit the synergies arising from international and product diversification to enhance performance (Chang & Wang, 2007; Chao, Kim, Zhao, & Hsu, 2012; Hitt et al., 1997). The synergy from a dual-diversification strategy creates an environment in which firms obtain economies of scale by using common brand names and production facilities to serve different geographies (Pennings, Barkema, & Douma, 1994) or by introducing new products to cater to the demands of diverse customer groups (Hsu, 2006; Tallman & Li, 1996). Some scholars have linked diversification synergies to the learning effect. Since both international and product diversification involve a

Table 1
Selected studies on the international diversification-performance relationship.

Relationship	Study	Theoretical rationale	ID measure	Performance	Sample
Linear					
Positive	Rugman (1976)	*Flexibility/Risk reduction:* International diversification offers opportunities to reduce risks if investments are made in non-correlated economies.	FSTS	ROI	492 Fortune 500 firms
Positive	Kostova and Zaheer (2002)	*Economies of scale:* Firms are able to achieve economies of scale by expanding into international markets and lowering manufacturing costs. *Internalisation:* Firms with higher R&D achieve higher gains because of the possibilities of earning higher revenue while lowering the coordination costs.	FRTR	ROA, OCTS	49 U.S. manufacturing firms
Positive	Chiao et al. (2012)	*Resource exploitation:* International diversification allows firms to acquire unique resources and overcome domestic constraints, thus giving them a competitive advantage.	FSTS	Tobin's Q	887 Chinese firms
Negative	Dhanaraj and Beamish (2002)	*Liability of foreignness:* Performance decreases with increasing levels of international diversification because firms invest in irrelevant activities.	Foreign sales	FVMV	750 U.S. non-financial firms
Negative	Chao et al. (2007)	*Governance costs:* International diversification increases costs of producing and processing new information, and increases managerial burden.	Entropy	Tobin's Q	2402 U.S. firms
Negative	Patel et al. (2018)	*Cross-national (regional) differences:* Risk of failure increases due to complexity arising from regional differences.	Entropy	Survival	680 Swedish born-globals
Quadratic					
∩	Grant et al. (1988)	*Economies of scale & Governance costs:* Positive effects of international diversification result from efficient resource allocation decisions. High international diversity increases inefficiency and administrative costs, politicises decision making, and puts a strain on top management team.	FRTR	ROA	255 U.K. MNEs
∩	Hitt et al. (1997)	*Economies of scale, Governance costs, & Cross-national (regional) differences:* International diversification provides opportunities of economies and amortise investment in R&D.Transaction costs, such as costs of coordination, information processing and logistics, increase with an increase in international diversification. Moreover, cultural diversity and country differences increase the complexity of managing foreign subsidiaries.	Entropy	ROA	295 firms
∩	Thomas and Eden (2004)	*Flexibility/Risk reduction & Governance costs*: Firm performance increases due to various opportunities provided by international diversification, such as differences in factor costs, flexibility, and access to unique resources. However, costs associated with cultural diversity, and economic and institutional differences decrease firm performance.	FATA, FSTS, country count	ROA	151 U.S. manufacturing firms
∪	Lipsey and Wilson (2001)	*Learning effect:* During the initial stages of internationalisation, performance decreases due to liability of foreignness. The liabilities are reduced as firms acquire experience, which contributes to positive performance.	Country count	ROA	164 Japanese SMEs
∪	Ruigrok et al. (2003)	*Learning effect:* Firms acquire knowledge about managing in unfamiliar environments gradually as they expand into new markets. However, the gradual expansion into culturally unrelated environments creates an imbalance between internal competencies and external environment. Performance pressures trigger the learning effect and firms reorganise internal competencies, thereby improving the performance.	FSTS	ROA, OCTS	84 German firms
∪	Miller et al. (2016)	*Economies of scale:* Initially, international diversification undermines performance due to start-up costs. However, economies of scale and access to resources increases performance.	FSTS, Hefindahl	ROA	2692 Japanese MNEs
Cuboid					
S	Lu and Beamish (2004)	*Learning effect & Governance costs:* Performance decreases during the initial stages of international expansion because firms face liabilities of newness and foreignness. With added internationalisation, firms accrue knowledge and experience about new markets; and international diversification allows them to exploit their ownership advantages over a wider scope. At high levels of international diversification, coordination and governance costs exceed the benefits of diversification, which results in decrease in performance.	FSFC	ROA,Tobin's Q	1498 Japanese MNEs
S	Ruigrok and Wagner (2007)	*Learning effect & Governance costs:* Liability of foreignness and newness faced by firms while entering into new markets outweigh the incremental benefits of international expansion. The learning acquired during the initial stages of expansion helps firms organise internal structures and adapt to external environments. At the point of "international threshold" governance and coordination costs outweigh the benefits of internationalisation.	FSTS	ROA	87 Swiss MNEs
Quartic					
M	Almodóvar and Rugman (2014)	The ID-P relationship displays an S-curve, although at the initial stages of internationalisation, performance increases because of opportunistic sales.	FSTS	ROA	110 Spanish INVs
M	Markides (2019)	*Cross-national (regional) differences, Learning effect, & Governance costs:* Performance is high during the initial stages of international diversification because the number of countries and foreign affiliates are low and firms can take advantage of their organisational infrastructure without making additional investments. However, as the number of countries and affiliates increase, the cross-national distance increases and performance decreases. Gradually, firms gain advantage using the knowledge acquired during the initial stages of international diversification. Finally, the costs of internationalisation extend beyond a certain threshold and exceed the benefits of entering new markets.	Country and subsidiary count	ROA, ROE	196 Spanish MNEs
W	Zhou (2018)	*Economies of scale, Learning effect, Governance costs, & Flexibility/Risk reduction:* Up-front costs of internationalisation and low economies of scale reduce performance in the initial stages of internationalisation. In the second	FSTS	ROS	535 Chinese manufacturing firms

(*continued on next page*)

Table 1 (*continued*)

Relationship	Study	Theoretical rationale	ID measure	Performance	Sample
		stage, performance increases because of increase in economies of scale and reduced liability of foreignness. In the third stage, governance costs increase due to higher demands of coordination among the subsidiaries, which reduces firm performance. In the fourth stage, firms are able to utilise their global network of subsidiaries to exploit arbitrage, access resources, and promote the learning effect.			

FSTS = Foreign sales to total sales, FRTR = Foreign revenue to total revenue, FSFC = Foreign subsidiaries to foreign countries, FVMV = Firm value to market value, ID = International diversification, OCTS = Operating costs to total sales, ROA = Return on assets, ROE = Return on equity, ROI = Return on investment, ROS = Return on sales.

significant investment in R&D, firms build up a reservoir of knowledge that can be implemented across different business activities. The knowledge accrued through this process can be cross-implemented and thus mutually beneficial for furthering the knowledge reservoir for future use (Grant, 1996). Moreover, the costs of sharing, adopting and implementing the skills and capabilities of other business units are lower if they operate in similar product environments (Chang & Wang, 2007). Therefore, firms that implement a related product diversification strategy in an international environment are in a position to adapt and react to external changes by using their interdivisional knowledge resources.

Another view posits that the integration of both diversification modes is detrimental to firm performance because of the added costs of governance and coordination. In general, the costs of governance increase as the global portfolio enlarges (Williamson, 1985). Thus, a diversified product portfolio will only add to the governance costs. In line with this, Tallman and Li (1996) argue that governance costs associated with a dual international-product diversification strategy outstrip the returns on investments and deplete firm performance. Hitt et al. (1997) argue that costs of communication and coordination are a positive function of increased foreign transactions. When these firms expand into new product segments, the interdependence between subsidiaries increases, thus leading to a complex organisational structure. The complex organisational structure increases information asymmetry and negatively affects managerial efficiency because of the confusion and inadequate understanding associated with a varied business portfolio (Chang & Wang, 2007).

Efficient management of international diversification based on learning gained during product diversification builds for a weak argument because both diversification modes require separate skills that are non-transferable and non-exchangeable. The added costs of acquiring knowledge about either new products or geographies will reduce the positive returns of diversification. In line with this argument, evidence shows that the costs of acquiring information are different for both diversification modes (Denis et al., 2002; Lu & Beamish, 2004). Therefore, firms that expand along the two dimensions of diversification are at a double cost disadvantage compared to firms that expand along only a single dimension (i.e., either firms that diversify into new geographic locations or firms that diversify into new product segments).

The complexities of managing a dual-diversified portfolio also arise externally. As firms expand into new product segments, they stretch their internal resources to a point where they may struggle to adapt to their new competitive environment (Ruigrok & Wagner, 2003). When product-diversified firms expand into new geographies, the differences in infrastructure and regulations, in particular patent regulations, may create obstacles in selling their products and achieving a competitive position in the new environment (Chang & Wang, 2007). It can also be argued that product-diversified firms, especially those from advanced economies, may find it difficult to sell their 'hi-tech' goods in developing or least developed countries because of the lack of familiarity of local consumers with technological advancements. Such firms will have to further diversify to develop goods particularly suited to local demands. Based on these arguments, we formulate the following hypothesis:

Hypothesis 2. Product diversification moderates the ID-P relationship such that performance will be higher among firms with low/related product diversification and lower among firms with high/unrelated product diversification.

3. Methodology

3.1. Sample and literature search

We adopted a six-stage literature search. First, we initiated a keyword search on *Google Scholar*, *ABI Inform*, *Scopus, EBSCOhost*, *ProQuest*, *SSRN,* and the *ISI Web of Knowledge* using combinations of terms, such as 'international diversification', 'multinationality', 'geographic scope', 'MNE', 'internationalisation', 'growth', and 'firm performance' (Kirca et al., 2011; Marano, Arregle, Hitt, Spadafora, & Essen, 2016). Second, we conducted a search of paper and electronic issues of leading journals in the fields of international business, strategic management, finance, and marketing. Third, we carefully inspected previous literature reviews and *meta*-analyses on similar topics (Annavarjula & Beldona, 2000; Bausch & Krist, 2007; Datta, Rajagopalan, & Rasheed, 1991; Geleilate, Magnusson, Parente, & Alvarado-Vargas, 2016; Kirca et al., 2011; Marano et al., 2016; Palich et al., 2000; Schommer, Richter, & Karna, 2019; Yang & Driffield, 2012) to identify studies that may have been overlooked.

Fourth, consistent with Cooper (1998) and Lee and Madhavan (2010), we traced relevant articles using the ancestry approach, which is a technique used to backward trace references using the articles in hand. The ancestry approach (alternatively "snowballing" or "pearl growing") has been emphasised by scholars as essential to *meta*-analysis studies (Booth, 2008; Ones, Viswesvaran, & Schmidt, 2017; Steel, Beugelsdijk, & Aguinis, 2021). Fifth, we forward-traced articles using the "Cited by" function on *Google Scholar*. Sixth, we searched for "grey literature" to address issues related to publication bias (Eisend & Tarrahi, 2014), file-drawer problems (Rosenthal, 1995), and the "Matthew Effect" (Steel et al., 2021). After combining the six data collection stages, we were able to accumulate an initial pool of over 900 studies.

We screened the initial pool by including full-length studies that reported usable statistical information on the hypothesised relationships (e.g., sample size *N*, correlation coefficient *r*, *t*-statistic, *F*-value, *z*-value, and β coefficient) and by excluding duplicate studies and overlapping samples. In some cases, we transformed the *t*-statistic, *F*-value or *z*-value into *r* using the methods recommended by Hunter and Schmidt (1990) and Lipsey and Wilson (2001) and the β coefficient into *r* using the formula provided by Peterson and Brown (2005). After inserting the inclusion and exclusion criteria, we were left with a usable sample of 263 effect sizes from 187 primary studies (178 published in 57 journals and 9 unpublished papers) dated between 1974 and 2021. Fig. 1 summarises our literature search and screening process. The observation period for all 187 studies ranged from 1960 to 2016. The list of studies included in the meta-analysis is available from the authors upon request.

3.2. Measurement of variables

We included six different categories of firm performance. The accounting measures include ROA (Berry & Kaul, 2016), ROS (Thomas, 2006), ROE (Pattnaik & Elango, 2009), ROI (Rugman, 1976), OCTS

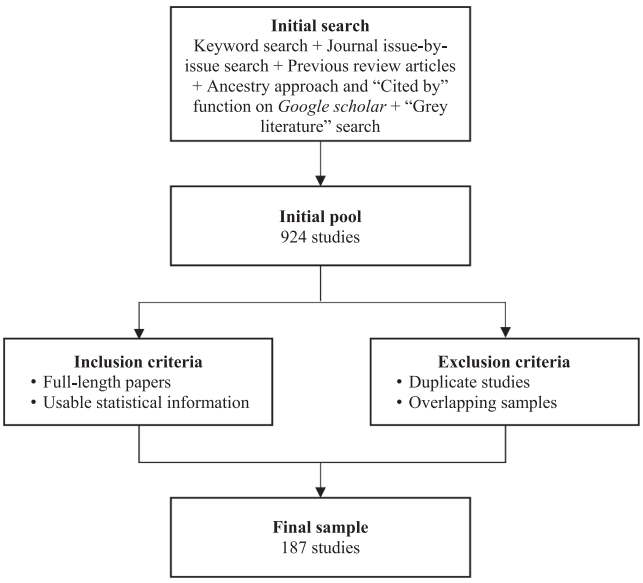

Fig. 1. Overview of literature search.

(Ruigrok & Wagner, 2003), and EBIT (Chen & Hsu, 2010). Market-based measures include Tobin's Q (Christophe & Lee, 2005), FVBV or MVBV (Goerzen & Beamish, 2003), and share price or cumulative abnormal returns (Doukas & Lang, 2003). Revenue-based measures include sales growth (Siddharthan & Lall, 1982) and profitability (Riviere & Bass, 2019). Following Delios et al. (2008), we included subsidiary survival as a performance measure. Few studies have included composite or combination performance measures (e.g., Hsu & Pereira, 2008; Pangarkar, 2008). Given the great degree of variation in operationalising composite measures, we include such studies under a single category.

The measurement of international diversification was a critical issue that had to be resolved to enable the testing of the relationship between international diversification and firm performance. Palich et al. (2000) used a categorical variable to classify single product firms as least diversified; and multi-product firms as highly diversified. The measurement of international diversification is more complicated than the measurement of product diversification. Internationally diversified firms include those operating in a few countries but having a higher return on sales and those with subsidiaries spread across multiple countries and regions. To resolve this issue, we adopted the 'type of multinationality' classification used in previous studies (Annavarjula & Beldona, 2000; Kirca et al., 2012; Thomas & Eden, 2004). Accordingly, studies that examined the intensity or depth of internationalisation (e.g., FSTS, FRTR, FATA, foreign sales) were coded 0; studies that examined the spread or breadth of a firm's foreign operations (e.g., country count, subsidiary count, FSFC) were coded 1; and studies that included a composite measure for international diversification (i.e., including both the intensity and spread of internationalisation) were coded 2.

Following Palich et al. (2000) and Schommer et al. (2019), we operationalised product diversification as related and unrelated. We sourced this information from the original studies by looking for key terms, including 'related/unrelated', 'vertical/horizontal expansion', 'core/noncore', or 'single/multiple sector'. Testing for the performance implications of international diversification necessitates that we control for firm-specific assets, as suggested by the internalisation theory (2009; Buckley & Casson, 1976). Accordingly, we included firm size, R&D intensity and advertising intensity. Firm size was measured as a categorical variable (0 = SME/INV sample, 1 = MNE sample, 2 = mixed/unclassified sample). For R&D and advertising intensity, we adopted the approach of Bausch and Krist (2007) and split our sample into studies that reported the average R&D or advertising expenses to total sales above or below 5 percent. Home country development was included as a categorical variable (0 = advanced economy, 1 = emerging economy). We included median sample years reported in individual studies to observe the change in the ID-P relationship over time (Schommer et al., 2019; Tang & Buckley, 2020). Finally, we included a dummy variable to check for endogeneity bias.

3.3. Method of meta-analysis

We employed two *meta*-analytical methods. First, we conducted the Hedges-Olkin type *meta*-analysis (HOMA), which involves regressing the correlation coefficients onto the hypothesised variables (Hedges & Olkin, 1985). We used both Pearson's correlation coefficients and partial correlation coefficients in the HOMA analysis. Second, consistent with recent *meta*-analytical studies (Bailey, 2018; Schommer et al., 2019), we conducted a *meta*-regression analysis (MARA). This method allowed us to test the moderation effects and to control for methodological artefacts. We used the Biostat Comprehensive Meta Analysis Version 3 software package to conduct our analysis.

Before running the *meta*-analyses, we corrected for statistical errors following various recommended procedures. First, to maintain consistency with the direction of effects, we reverse-coded variables that used an inverted scale (Schommer et al., 2019). For example, a high value of the Herfindahl index or Rumelt's category indicated low diversification, and in the survival models, 0 indicated survival and 1 indicated exit. After reverse-coding the items, a high value of the Herfindahl index and Rumelt's categories indicated high diversification, and in the survival models, 0 indicated exit and 1 indicated survival. Thus, we were able to obtain consistency with the direction of effects.

Second, to correct for skewness in the sample distribution, *r*-values were back transformed using Fisher's *z*-transformation (Silver & Dunlap, 1987). Initially, the *r*-values were transformed into Fisher's *z*-values using the following formula: $z_{ijk} = \frac{1}{2}\ln\left(\frac{1+r_{ijk}}{1-r_{ijk}}\right)$, where r denotes the correlation between variables i and j for study k. The estimated *z*-values were averaged by assigning the weight of N-3, where N denotes the sample size of each observation, and the results were back transformed into the correlation coefficient $\bar{r}$ using the following formula: $\bar{r} = \frac{e^{2\bar{z}_{ij}-1}}{e^{2\bar{z}_{ij}+1}}$, where $\bar{z}$ denotes the weighted *z*-value between variables i and j.

4. Results

4.1. General findings

An overview of the ID-P relationship is presented in Table 2. The results suggest that the ID-P relationship is positive, with an average correlation coefficient of 0.076 ($p < 0.001$). The mean r for *ID* is statistically significant, as indicated by the confidence intervals, which do not include zero (Whitener, 1990). However, there is a high degree of variance, as indicated by the high Q and I^2 values. The mean r is 0.079 for *Intensity/Depth* ($p < 0.001$), 0.037 for *Spread/Breadth* ($p < 0.01$), and 0.119 for *Composite* ($p < 0.001$). The positive and statistically significant mean correlations indicate a moderating influence of the measure of international diversification on the overall ID-P relationship (Marano et al., 2016). Another indication of the moderating effect is the non-overlapping confidence intervals for *Intensity/Depth* (CI = 0.058 to 0.100) and *Spread/Breadth* (CI = 0.015 to 0.057).

The results in Table 2 also suggest that the heterogeneity in the ID-P relationship can be partly attributed to the choice of firm performance measure. A general observation suggests a great degree of variation among the choice of performance measures, with *ROA*, *ROS*, and *ROE* being preferred by over 66% of the total effect sizes. For accounting performance measures, the relationship is positive for *ROA*, *ROS*, *ROE* and *EBIT*, whereas the relationship for *OCTS* is negative and non-significant for *ROI*. For the market-based performance measures, the relationship is positive for *Tobin's Q* and *FVMV* and non-significant for

Table 2
Overview of international diversification performance relationship.

					95% CI					Trim-and-fill		
Variable	K	N	Mean r	SE	LB	UB	Q	I^2	Fail safe N	L_0	R_0	Imputed r
ID	263	425,327	0.076***	0.007	0.061	0.090	4355.005***	93.984	31,911	0	23	0.102
Intensity/Depth	156	274,875	0.079***	0.011	0.058	0.100	3297.311***	95.299	2849	0	16	0.112
Spread/Breadth	75	123,000	0.037**	0.011	0.015	0.057	768.669***	90.373	1256	22	0	−0.014
Composite	32	27,452	0.119***	0.022	0.077	0.161	321.785***	90.336	1694	10	0	0.054
Performance measures												
Accounting measures												
ROA	99	168,086	0.058***	0.009	0.040	0.076	1001.247***	90.212	4795	0	1	0.059
ROS	43	162,737	0.052***	0.014	0.024	0.080	432.160***	90.912	90	2	0	0.045
ROE	34	16,033	0.089***	0.022	0.046	0.132	211.698***	84.412	742	0	4	0.108
ROI	6	3655	0.135	0.069	−0.001	0.271	71.908***	93.047	79	1	0	0.066
OCTS	3	1039	−0.232***	0.054	−0.338	−0.126	4.464	55.199	33	2	0	−0.296
EBIT	5	2812	0.091**	0.034	0.024	0.158	10.407*	61.563	24	0	0	–
Market-based												
Tobin's Q	16	13,006	0.082***	0.022	0.039	0.125	74.309***	79.814	255	1	0	0.075
FVMV	5	10,072	0.162***	0.165	−0.163	0.486	556.539***	99.281	12	0	0	–
Share price/CAR	4	2927	−0.027	0.172	−0.364	0.311	230.111**	98.696	12	1	0	−0.118
Revenue-based												
Sales growth	18	8699	0.099**	0.030	0.040	0.158	95.654***	82.228	178	0	0	–
Profitability	6	1924	0.185	0.096	−0.003	0.372	75.370***	93.366	94	0	0	–
Other												
Subsidiary survival	9	31,247	−0.010	0.024	−0.056	0.037	93.172***	91.463	0	0	0	–
Composite	5	855	0.249**	0.083	0.087	0.411	19.552**	79.542	45	2	0	0.150
Self-reported	9	1315	0.335**	0.099	0.141	0.530	97.575***	91.801	279	0	1	0.383

Note: Christophe and Lee (2008) use categorical performance measure and therefore, we do not include in any of the sub-categories.
K = Effect size, N = Sample size, SE = Standard error, CI = Confidence interval, LB = Lower bound, UB = Upper bound, Q = Cochran's homogeneity test statistic, I^2 = Scale free index of heterogeneity, L_0/R_0 = Trim-and-fill model estimators (see Duval & Tweedie, 2000 for details), ID = International diversification, ROA = Return on assets, ROS = Return on sales, ROE = Return on equity, ROI = Return on investment, OCTS = Operating capital to total sales, EBIT = Earnings before interest and tax, FVMV = Firm value to market value, CAR = Cumulative abnormal returns.
***p < 0.001, **p < 0.01, *p < 0.05

Share price/CAR. For revenue-based measures, the ID-P relationship is positive for *Sales growth* and non-significant for *Profitability*. Furthermore, the ID-P relationship is positive for *Composite* and *Self-reported* performance measures. Overall, the finding that the ID-P relationship is positive is consistent with prior *meta*-analyses (Bausch & Krist, 2007; Geleilate et al., 2016; Kirca et al., 2011; Marano et al., 2016).

4.2. Curvilinearity diagnostics

We provide the results for curvilinearity diagnostics in Table 3. We separated 97 effect sizes reporting curvilinear relationships from the main sample. Furthermore, we separated studies depending upon the nature of curvilinearity. In the U-shaped models, the linear term is positive (mean r = -0.052, p < 0.5) but the quadratic term is non-significant. In the inverted U-shaped ID-P models, the linear term is

Table 3
Results for curvilinear international diversification-performance relationships.

					95 % CI					Trim-and-fill		
Variable	K	N	Mean r	SE	LB	UB	Q	I^2	Fail safe N	L_0	R_0	Imputed r
Quadratic models												
⋃ *curve*												
ID	19	23,982	−0.052*	0.023	−0.096	−0.007	97.984***	81.630	56	0	0	–
ID^2	19	23,982	0.031	0.016	−0.001	0.063	45.392***	60.345	32	8	0	−0.007
∩ *curve*												
ID	31	18,057	0.084**	0.026	0.033	0.135	303.431***	90.113	497	0	6	0.134
ID^2	31	18,057	−0.060***	0.013	−0.086	−0.034	68.763***	56.372	363	0	0	–
Cuboid models (S curve)												
ID	40	194,237	−0.027	0.014	−0.054	0.001	714.380***	94.541	410	0	8	0.019
ID^2	40	194,237	0.061	0.035	−0.008	0.129	5555.736***	99.298	1376	0	10	0.167
ID^3	40	194,237	−0.034	0.025	−0.082	0.015	2642.765***	98.524	380	0	14	0.081
Quartic models												
M curve												
ID	5	6047	0.133**	0.043	0.050	0.216	36.979***	89.183	73	0	1	0.173
ID^2	5	6047	−0.068***	0.016	−0.009	−0.037	5.537	27.763	24	2	0	−0.079
ID^3	5	6047	0.041	0.039	−0.036	0.118	31.261***	87.205	4	0	0	–
ID^4	5	6047	−0.049	0.036	−0.119	0.021	25.559***	84.350	10	0	0	–
W curve												
ID	2	4481	−0.069***	0.015	−0.098	0.040	0.587	0	–	–	–	–
ID^2	2	4481	0.388	0.346	−0.289	1.066	59.494***	98.319	–	–	–	–
ID^3	2	4481	−0.568	0.535	−1.617	0.480	142.351**	99.298	–	–	–	–
ID^4	2	4481	0.323	0.301	−0.267	0.912	45.048***	97.780	–	–	–	–

K = Effect size, N = Sample size, SE = Standard error, CI = Confidence interval, LB = Lower bound, UB = Upper bound, Q = Cochran's homogeneity test statistic, I^2 = Scale free index of heterogeneity, L_0/R_0 = Trim-and-fill model estimators (see Duval & Tweedie, 2000 for details), ID = International diversification
***p < 0.001, **p < 0.01, *p < 0.05

positive (mean $r = 0.084$, $p < 0.01$), and the quadratic term is negative (mean r = -0.060, $p < 0.001$). The results for cuboid relationships are non-significant for all three terms (linear, quadratic, and cubic). For the quartic M−shaped models, the linear term is positive (mean $r = 0.133$, $p < 0.01$), the quadratic term is negative (mean r = -0.068, $p < 0.001$), and both cubic and quartic terms are non-significant. The results for W-shaped models are significant only for the linear term (mean r = -0.069, $p < 0.001$). A consolidation of these results points towards an inverted U-shaped ID-P relationship, and therefore, supports our Hypothesis 1. It is important to note that the number of effect sizes for the quartic M−shaped (K = 5) and W-shaped (K = 2) models is significantly lower than that for the quadratic (K = 50) and cuboid models (K = 40), which makes it difficult to generalise our findings.

4.3. Moderator analysis

In Table 4, we present the Hedges-Olkin type *meta*-analysis results for the moderation analysis of product diversification and contextual factors, such as firm size, firm R&D intensity and level of home country development. As suggested, the mean r for the overall *PD* is non-significant, the mean r for *high/unrelated PD* is negative (mean r = -0.089, $p < 0.001$), whereas the mean r for *Low/Related PD* is positive (mean r = 0.036, $p < 0.05$). Supporting Hypothesis 2, the results suggest that *High/Unrelated PD* has a negative influence on the ID-P relationship and *Low/Related PD* has a positive influence. Moreover, the confidence intervals for *High/Unrelated PD* and *Low/Related PD* do not overlap, which suggests a clear and separate moderation effect of both product diversification strategies.

Consistent with the internalisation theory, we tested the influence of contextual factors on the ID-P relationship. First, we tested whether the ID-P relationship is affected by firm size. As shown in Table 4, *Firm size* has a significant but relatively small impact on the ID-P relationship (mean $r = 0.063$, $p < 0.001$). Furthermore, the performance seems to be smaller in *MNEs* (mean $r = 0.046$, $p < 0.05$) compared to a *mixed* sample of firms (mean r = 0.088, $p < 0.001$). Second, we tested whether ownership of intangible assets benefited internationally diversified firms. The results in Table 4 suggest that both *Firm R&D intensity* (mean r = 0.093, $p < 0.001$) and *Firm advertising intensity* (mean $r = 0.058$, $p < 0.001$) have a positive influence on the ID-P relationship. The mean r is higher among firms with *High R&D intensity* (mean $r = 0.175$, $p < 0.001$) and *High advertising intensity* (mean r = 0.069, $p < 0.05$). Finally, we tested the influence of the country of origin effect on the ID-P relationship. Table 4 reveals no difference between the performance of internationally diversified firms from both advanced (mean $r = 0.077$, $p < 0.001$) and *Emerging economies* (mean $r = 0.076$, $p < 0.001$). In fact, the near identical mean r for both sub-groups challenges common wisdom that firms from advanced economies tend to outperform their counterparts from emerging economies.

We conducted additional diagnostics to test the nature of curvilinearity based on the level of home country development and firm size. As shown in Table 5, the inverted U-shaped curve appears to be stronger in firms from *Advanced economies* and in *MNEs*. While we did not find any significant S-shaped relationship in the home country or firm size analyses, in the M−shaped models, the ID-P relationship is significant only for the quadratic terms among *Advanced economies*, *Emerging economies* and *MNEs*. This corroborates our initial finding that the ID-P relationship has an inverted U-shaped.

4.4. Meta-regression analysis

We provide the *meta*-regression analysis results for the ID-P relationship in Table 6. Model 1 includes control variables. Model 2 includes the linear and squared terms for international diversification and Model 3 tests the moderation effect of overall product diversification. Model 4 and Model 5 test the moderation effect of high product diversification, and Model 6 and Model 7 test the moderation effect of low product diversification. We predicted that product diversification moderates the ID-P relationship such that the performance of firms with low/related product diversity will be higher than in firms with high/unrelated product diversity. In Model 2, the coefficients for *ID* ($\beta = 0.048$, $p < 0.001$) and ID^2 (β = -0.027, $p < 0.1$) indicate an inverted U-shaped curve, thus corroborating our findings in section 4.2 and lending support to Hypothesis 1. After inserting *PD* (β = -0.141, $p < 0.1$) in Model 3, the coefficient for *ID* ($\beta = 0.014$, $p < 0.01$) weakens, whereas, the coefficient for ID^2 (β = -0.130, $p < 0.05$) strengthens, suggesting a clear moderation effect of product diversification. The coefficients for *High PD* in Model 4 (β = -0.200, $p < 0.01$) and Model 5 (β = -0.220, $p < 0.01$) indicate that high product diversification has a negative and significant impact on firm performance. The interaction term *ID* × *High PD* (β = -0.130, $p < 0.1$) in Model 5 supports our hypothesis that performance is lower for international firms with high product diversity. Furthermore, the positive coefficients for *Low PD* in Model 6 ($\beta = 0.351$, $p < 0.05$) and Model 7

Table 4
Results for moderating influence of product diversification and contextual factors.

					95 % CI					Trim-and-fill		
Variable	K	N	Mean r	SE	LB	UB	Q	I^2	Fail safe N	L_0	R_0	Imputed r
PD	82	103,124	−0.008	0.013	−0.034	0.018	996.354***	91.870	111	2	0	−0.013
High/Unrelated PD	45	65,965	−0.089***	0.018	−0.123	−0.054	503.785***	91.266	2384	0	2	−0.082
Low/Related PD	37	37,159	0.036*	0.017	0.003	0.069	253.208***	85.782	47	11	0	−0.013
Firm size	218	400,722	0.063***	0.011	0.040	0.085	9063.769***	97.606	54,061	0	48	0.125
MNE	98	159,375	0.046*	0.018	0.009	0.082	4298.008***	97.743	3717	0	29	0.121
SME/INV	29	22,229	0.037	0.025	−0.012	0.085	314.454***	91.096	32	6	0	−0.004
Mixed/Unclassified	91	219,118	0.088***	0.016	0.056	0.119	3461.955***	97.156	26,630	0	0	–
Firm R&D intensity	102	235,573	0.093***	0.024	0.046	0.139	9521.697***	98.939	5892	0	20	0.158
High R&D intensity	55	59,327	0.175***	0.029	0.118	0.233	2448.792***	97.795	10,837	0	1	0.181
Low R&D intensity	47	176,246	−0.049	0.037	−0.112	0.023	6048.664***	99.204	2643	8	0	−0.075
Firm advertising intensity	49	182,681	0.058***	0.013	0.033	0.083	648.121***	92.594	1679	0	6	0.075
High advertising intensity	27	19,189	0.069*	0.030	0.011	0.127	391.487***	93.359	532	0	6	0.112
Low advertising intensity	22	163,492	0.041**	0.013	0.015	0.067	208.994***	89.952	300	0	0	–
Advanced economies	163	155,846	0.077***	0.012	0.053	0.100	2870.424***	94.356	9348	0	26	0.119
Emerging economies	71	203,982	0.076***	0.012	0.052	0.100	1111.968***	93.705	2632	9	0	0.047
Transition economies/LDCs	7	1424	−0.011	0.067	−0.143	0.122	37.424***	83.967	0	0	0	–
Mixed/Unclassified	22	64,075	−0.012	0.018	−0.047	0.023	243.645***	91.381	47	1	0	−0.018

K = Effect size, N = Sample size, SE = Standard error, CI = Confidence interval, LB = Lower bound, UB = Upper bound, Q = Cochran's homogeneity test statistic, I^2 = Scale free index of heterogeneity, L_0/R_0 = Trim-and-fill model estimators (see Duval & Tweedie, 2000 for details), PD = Product diversification, LDC = Least Developed Country
***p < 0.001, **p < 0.01, *p < 0.05

Table 5
Results for moderation effects of home country development and firm size in curvilinear models[a.]

Model	Quadratic (⋃ curve)		Quadratic (∩curve)		Cuboid (S curve)			Quartic (M curve)			
	ID	ID^2	ID	ID^2	ID	ID^2	ID^3	ID	ID^2	ID^3	ID^4
Home country development[b.]											
Advanced economy	−0.073	0.055	0.065*	−0.031*	−0.035	0.147	−0.087	0.215*	−0.055**	0.005	−0.021
K	13		21			22			3		
N	4512		6886			23,131			3206		
Emerging economy	−0.034	0.003	0.051	−0.078*	−0.032*	0.044	0.050	0.079***	−0.094**	0.036	−0.036
K	4		8			12			2		
N	2178		10,378			131,992			2841		
Mixed/Unclassified	−0.015	0.019*	0.035	−0.093	0.028	0.033	−0.008	–	–	–	–
K	2		2			5					
N	17,238		793			38,829					
Firm size											
MNE	−0.029	0.017*	0.068***	−0.040***	−0.003	0.085	−0.026	0.059**	−0.055**	−0.002	−0.023
K	5		19			17			2		
N	18,896		10,142			50,034			3096		
SME/INV	−0.246***	0.060	−0.013	−0.154*	−0.034	0.021	0.243	0.237*	−0.060	0.090*	−0.092*
K	4		4			4			3		
N	660		1686			6301			2951		
Mixed/Unclassified	−0.001	0.007	0.124	−0.162*	−0.106***	0.039	−0.025	–	–	–	–
K	10		8			19					
N	4372		6229			137,902					

a. Quartic W-shaped curve not included in the analysis because of the small effect size, K = Effect size, N = Sample size, ID = International diversification
***p < 0.001, **p < 0.01, *p < 0.05

Table 6
Meta-regression analysis results.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	0.620	0.064	−1.215	0.126	0.256	0.147*	0.115*
	(3.849)	(1.306)	(1.012)	(1.698)	(6.269)	(8.628)	(1.700)
ID		0.048**	0.014**	0.023**	0.018**	0.061***	0.063***
		(0.035)	(0.160)	(0.048)	(0.136)	(0.196)	(0.048)
ID^2		−0.027ǂ	−0.130*	−0.104ǂ	0.170ǂ	−0.021ǂ	−0.017*
		(0.311)	(0.303)	(0.021)	(0.068)	(0.062)	(0.021)
PD			−0.141ǂ				
			(0.100)				
High PD				−0.200*	−0.220*		
				(0.046)	(0.201)		
ID × High PD					−0.130ǂ		
					(0.346)		
Low PD						0.351*	0.372*
						(0.147)	(0.187)
ID × Low PD							0.157ǂ
							(0.089)
Controls							
Firm size	0.047ǂ	−0.003	0.031	0.006	0.005	−0.005	−0.004
	(0.030)	(0.037)	(0.031)	(0.062)	(0.167)	(0.079)	(0.062)
Home country development	0.060ǂ	0.003	0.041	0.010	−0.004	−0.020*	−0.013*
	(0.045)	(0.047)	(0.040)	(0.020)	(0.066)	(0.029)	(0.021)
Median sample year	−0.001	−0.001	0.001	−0.001	−0.001	−0.002ǂ	−0.001ǂ
	(0.002)	(0.001)	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)
Endogeneity control	−0.020ǂ	−0.019	−0.020	−0.021ǂ	−0.020ǂ	−0.031	−0.019
	(0.010)	(0.011)	(0.009)	(0.012)	(0.016)	(0.062)	(0.009)
Q	826.19**	862.88***	419.04***	333.70***	331.60***	338.72***	335.19***
Residual Q	837.18***	863.20***	419.19***	724.15***	724.02***	738.76***	736.15***
R^2	0.46	0.42	0.17	0.05	0.07	0.16	0.18

Unstandardised beta coefficients with robust standard error in parentheses
ID = International diversification, PD = Product diversification, ***p < 0.001, **p < 0.01, *p < 0.05, ǂ p < 0.1

(β = 0.372, p < 0.05) suggest that performance in firms with low/related PD is high. The coefficient associated with the interaction term *ID × Low PD* is positive and significant (β = 0.157, p < 0.1), which supports the hypothesis that performance in firms with low product diversity in high.

The MARA results reveal that the relationship between international diversification and product diversification is complex in nature. As shown in Table 6, the coefficient for *High PD* is stronger in Model 5 (β = -0.220, p < 0.01) than in Model 4 (β = -0.200, p < 0.01) and the coefficient for *Low PD* is stronger in Model 7 (β = 0.372, p < 0.01) than in Model 6 (β = -0.351, p < 0.01). The change in coefficients after entering respective interaction terms points towards a potential two-way interaction between international diversification and product diversification.

While we argued that product diversification increases coordination and governance costs, our findings suggest that firms are able to recover some of the costs by exploiting their knowledge resources in foreign markets.

In addition, the results in Table 6 are not affected by the size of firms, as indicated by the non-significant coefficients for the control variable *Firm size*. As indicated by Models 6 (β = -0.020, p < 0.05) and 7 (β = -0.013, p < 0.05), the performance among firms with low product diversification is negatively associated with *Home country development*. The ID-P relationship and the interaction between international diversification and product diversification seem to be unchanged over the 1974–2021 period, as indicated by the non-significant coefficient associated with the *Median sample year*. However, as indicated in Model 6 (β = -0.002, p < 0.1) and Model 7 (β = -0.001, p < 0.1), the ID-P relationship for firms with low product diversification tends to have become marginally negative over time. Consistent with Marano, Arregle, Hitt, Spadafora, and Essen (2016), the moderating effect of *Endogeneity bias* is negative (β = -0.035, p < 0.1), thus confirming that studies controlling for endogeneity tend to report weaker results.

4.5. Reliability and robustness tests

We were concerned with the reliability of our results, including the sampling error variance, artefact correction, overlapping samples, presence of outliers, and publication bias. It is essential to check for sampling error variance because the study validity varies according to sampling error. We checked for sampling error variance following the procedure recommended by Hunter and Schmidt (1990). Accordingly, the sampling error variance was estimated as follows: $S_e^2 = \frac{(1-r^2)^2}{N-1}$, where r is the correlation coefficient and N is the average effect size. The estimated sampling error variance in our study was at an acceptable level of 0.087 (8.79%).

Since there is no best method for artefact correction, it is advisable to conduct a *meta*-analysis using both corrected and uncorrected effects. To test the robustness of our findings, we replaced the *z*-transformed correlations with raw correlations. Consistent with the results in Table 2, the mean *r* for ID was 0.076 (p < 0.001, CI = 0.061 to 0.090). Similarly, the results in Table 3 were consistent after replacing the *z*-transformed values with raw correlations. To determine whether our results were affected by overlapping samples, we conducted separate analyses for single-effect size data (K = 207). The results were similar to those in Table 2, where the mean *r* for ID was 0.074 (p < 0.001, CI = 0.058 to 0.090). Detailed results for both robustness tests are available from the authors upon request.

Because of the considerably large sample size, it was mandatory to check if the results were distorted due to the presence of outliers (Yuan & Bentler, 2001). Consistent with Hunter and Schmidt (1990), we checked the outliers using the 'data trimming' technique. Two recommended methods of data trimming are as follows: (1) most extreme 10%, i.e., 5% of the highest and 5% of the lowest values (Huber, 1981; Walfish, 2006); and (2) 2% of the top and bottom extremes (Hunter & Schmidt, 1990). There were no significant changes in the results after running the analyses using either trimming method.

Publication bias is a critical issue in *meta*-analyses. We took the necessary measures to avoid bias at the data collection and coding stage, and statistical tests are available to detect publication bias. The commonly used tests to detect publication bias are Rosenthal (1979) Fail-safe N and Duval and Tweedie (2000) trim-and-fill method. As reflected in Table 2, the Fail-safe N suggests that 31,391 studies reporting null results are required to bring the overall results of this *meta*-analysis to a point of non-significance. The results for Duval and Tweedie (2000) trim-and-fill method indicate that the number of missing studies due to publication bias using estimator R_0 is 23. The funnel plot presented in Fig. 2 shows our sample distribution along with 23 imputed studies.

5. Summary and discussion

The two main objectives of this paper were to critically evaluate the nature of the ID-P relationship and to test the moderation effect of product diversification. To attain our objectives, we conducted a *meta*-analytical review of 263 effect sizes from 187 primary studies between 1974 and 2021. The observation period of almost five decades allowed us to include a diverse set of theoretical approaches, empirical models, and hypothesised relationships. Our focus was on the nature of the hypothesised relationships, and we observed that the ID-P relationship gradually developed from a simple positive linear relationship to a more complex sigmoid and M−shaped relationship. We provide a comparative summary between our study and prior reviews and *meta*-analyses on the ID-P relationship in Table 7.

This study makes two contributions to the literature. First, our results help resolve the debate on the nature of the ID-P relationship. After testing different linear and non-linear models, we conclude that the ID-P relationship has an inverted U shape. We do not find any support for the U curve, S curve, or quartic M and W curves. The *meta*-analytical results are only significant until the quadratic terms, or until 'Stage 1 and 2′ of internationalisation (Contractor, 2007; Contractor et al., 2007). This finding is in contrast to previous *meta*-analyses, such as by Kirca et al. (2012) and Yang and Driffield (2012), who reported a U-shaped ID-P relationship, or Marano et al. (2016), who did not find support for a curvilinear relationship.

Our second contribution is related to the moderating role of product diversification. Internationally diversified firms with low product diversity outperformed firms with high product diversity. This finding corroborates the findings of Bausch and Krist (2007). Interestingly, our results point towards reverse causality between international diversification and product diversification. By expanding in foreign markets, firms partly recover the costs associated with product diversification. Hence, performance is marginally higher for firms pursuing a dual international-product diversification strategy.

5.1. Theoretical implications

Our study contributes to the literature on the ID-P relationship along the internalisation and transaction cost theory. As noted by the internalisation theory (2009; Buckley & Casson, 1976), market imperfections are the basis for returns from cross-border activities. Firms are able to exploit market imperfections using their intangible assets, which is the key for higher performance during early stages of internationalisation. The decrease in firm performance at advanced stages of internationalisation can be explained by (1) increased governance and coordination costs; (2) knowledge burden on the management teams; and (3) changes in external markets that make the intangible assets of the firm redundant.

Our argument that related product diversification is beneficial for global firms is consistent with the line of research positing that common knowledge permits effective learning across business units (Chang & Wang, 2007; Grant, 1996; Makri, Hitt, & Lane, 2010; Zappa & Robins, 2016). The findings from our *meta*-analysis support the view that firms exploit the interdependencies across business and geographic segments to achieve synergistic gains. It is less costly to share knowledge among business units operating in similar segments, which partly explains the positive performance. The existing reservoir of knowledge can then be developed further over time to enter new segments and geographies.

Following the internalisation theory, we controlled for intangible assets to test whether the ID-P relationship remained positive. As evident from our results, performance is higher among firms with higher R&D and advertising intensity. While this result highlights the importance of resources and ownership advantages for successful international growth (Dunning, 1988; 2000), it also supports our notion that changes in external market conditions can be approached by higher investment in knowledge acquisition activities.

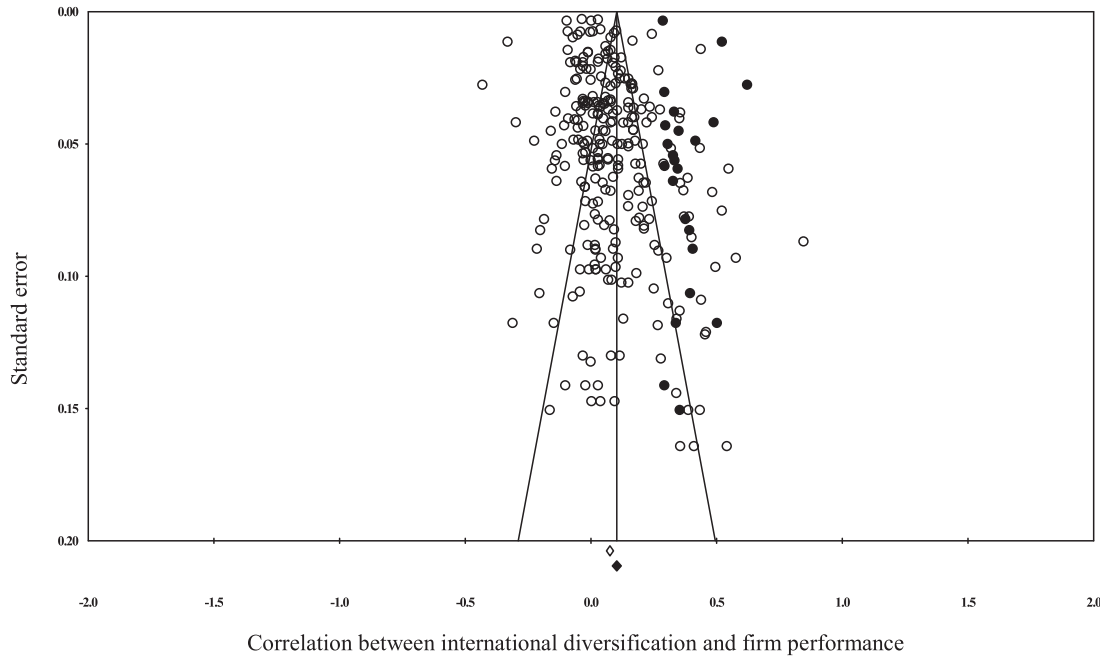

Fig. 2. Funnel plot for international diversification-performance relationship.
Note: Diagonal lines indicate 95% confidence intervals. Hollow dots indicate sample studies and solid dots indicate imputed studies.

5.2. Methodological implications

The ID-P literature is characterised by measurement and modelling issues. Unlike product diversification, where a subsidiary can be categorised as related or unrelated by comparing the SIC codes, categorising a foreign subsidiary as internationally related or unrelated is more complex. Although there is no established methodology for categorising a foreign subsidiary as internationally related or unrelated, the international diversity of a firm can be classified based on the proportion of the firm's sales in related and unrelated country clusters (Chan Kim, Hwang, & Burgers, 1989; Vachani, 1991). Country clusters can be classified based on socio-economic ties or cultural similarities between countries (Minkov & Hofstede, 2012; Ronen & Shenkar, 1985).

It is also worth considering that the negative relationship between over-diversification and firm performance may not necessarily imply that diversifying firms are not generating enough returns (Markides, 1995). Hence, it is essential for scholars interested in examining the link between diversification and performance to consider the marginal contribution of diversification to overall firm performance. Only after conducting a comparative analysis of the two phenomena will we be able to better understand the intrinsic nature of the diversification-performance relationship.

5.3. Managerial implications

The results of our study have key implications for managers. Our finding that low/related product diversification has a positive moderating effect on the ID-P relationship encourages managers to pursue an integrated international-product diversification strategy with the caveat that the firm expands into related product segments. In support of Hitt et al. (1997), we argue that managerial learning takes place during the process of diversification, which encourages firms to invest in R&D activities to maintain a steady flow of knowledge. However, the learning effect is two-directional. Through international diversification, firms acquire key knowledge about the local demand conditions in the host country, which is useful in designing products or brands to suit the local market. Similarly, knowledge acquired through product diversification helps firms identify new markets.

Our findings suggest that firm performance decreases at higher levels of international diversification and that the relationship is stronger among firms with high/unrelated product diversification. Although a dual diversification strategy offers several alternatives to expand business operations across a broader spectrum of product and geographic segments, it increases the knowledge burden on managers and reduces their efficiency to make timely decisions. In addition, diversification activities may also create a feeling of complacency among managers for having done the job of researching new products and geographic segments. This is likely to have a detrimental effect on managerial decision-making capability and subsequently on firm performance.

One factor that remains underexplored is the openness of the host country to imports, inward FDI and new products. An openness to imports and inward FDI means that the host government provides several incentives, including a reduction in tariff and non-tariff barriers, making the environment conducive for foreign investors and traders (Banga, 2003; Sambharya & Rasheed, 2015). Openness to new products means that consumers are generally willing to buy unfamiliar or new products. Thus, the demand for new products can be expected to remain stable, at least in the short run. We expect that the presence of both of these factors will encourage firms to pursue an integrated international-product diversification strategy.

5.4. Limitations and future research direction

Common with most *meta*-analyses, our study is subject to both theoretical and methodological limitations. The first limitation of our study is affiliated with the measurement of product diversification. We examined the moderation effect of product diversification on the ID-P relationship. Although we examined different degrees of international diversification, we were not able to replicate the same method in the case of product diversification, which was mainly due to the assortment of measures that have been used in the extant literature. We identified several measures of product diversification, including the Herfindahl-type measure (Lin, Liu, & Cheng, 2011; Lu & Beamish, 2004), entropy measure (Altaf & Shah, 2015; Delios et al., 2008; Mohr, Batsakis, & Stone, 2018), Rumelt (1982) categorisation (Bühner, 1987), SIC relatedness (Borda et al., 2017; Doukas & Lang, 2003; Zhao & Luo, 2002) and

Table 7
Comparative summary of reviews on international diversification-performance relationship.

Study	Method	N	Sample	Period	PD[a]	Country effects	Curvilinearity diagnostics	Findings
Annavarjula and Beldona (2000)	CA	26	–	1971–1998	–	–	–	1. Multinationality is a multifaceted construct, and its effect on firm performance is poorly understood. 2. A three-dimensional conceptualisation of international diversification is proposed.
Bausch and Krist (2007)	HOMA	36	Pearson's *r*	1979–2004	Yes	Yes	No	1. There is a positive relationship between internationalisation and performance. 2. The ID-P relationship is stronger in young firms, firms with high R&D intensity and low product diversification, and firms from North America.
Hennart (2007)	TR	–	–	–	–	–	–	1. Using the transaction cost theory challenges the key arguments that multinationality (1) facilitates economies of scale, (2) provides access to resources, and (3) provides opportunities to learn. 2. A direct relationship likely does not occur between multinationality and firm performance.
Verbeke and Brugman (2009)	TR	–	–	–	–	–	–	1. Research on ID-P relationship is not robust. 2. There is no valid theoretical rationale to predict a generalisable relationship. 3. The majority of studies are based on a superficial conceptualisation of diversity. 4. A three-category framework is provided to test the quality of ID-P literature.
Hennart (2011)	TR	–	–	–	–	–	–	1. At the construct level, international diversification is unrelated to performance because there is a mismatch between theoretical arguments and measurement of international diversification. 2. Flexibility of firms to react to level of internationalisation holds the potential to explain performance changes.
Kirca et al. (2011)	HOMA/ MARA	111	Pearson's *r*	1994–2007	No	Yes	No	1. Multinationality enables firms to transfer their ownership advantages to generate higher returns. 2. Multinationality has intrinsic value above and beyond intangibles assets possessed by firms.
Kirca et al. (2012)	HOMA	141	Pearson's *r*	Prior to 2010	No	Yes	No	1. Effects of multinationality depend on type of multinationality, strategic motivations, industry characteristics, and home country factors. 2. Firm size and stage of internationalisation are not significant moderators.
Verbeke and Forootan (2012)	TR	12	–	1987–2004	–	–	–	1. Firm-specific advantages are the key drivers of MNE success and performance. 2. Very few ID-P studies meet the baseline quality requirements for being methodologically sound. 3. Different ID-P curves are attributed to the lack of methodological soundness.
Yang and Driffield (2012)	MARA	54	β-coefficient	1974–2008	No	Yes	Yes: quadratic and cubic terms	1. Returns to multinationality are higher for non-U. S. firms. 2. U.S. firms are less likely to face losses during initial stages of internationalisation.
Geleilate et al. (2016)	HOMA/ MARA	170	Pearson's *r*	1982–2013	No	Yes	No	1. The moderating influence of home country institutions on ID-P relationship varies greatly across level of home-country development. 2. The ID-P relationship is stronger for advanced economy firms. 3. The ID-P relationship is weaker for emerging economy firms.
Marano et al. (2016)	HOMA/ MARA/ HiLMMA	359	Pearson's *r* and partial correlations	1972–2012	No	Yes	Yes: quadratic and cubic terms	1. The ID-P relationship is linear and positive but the overall effect is small. 2. The ID-P relationship varies greatly across home-countries.
Nguyen (2017)	CA	135	–	1960–2016	–	–	–	1. Performance through internationalisation can be attained through firm-specific assets relative to the rival firms. 2. There is an inter-relationship between firm-specific assets and performance such that profits are retained for reinvestment and R&D to create further firm-specific assets.
Nguyen and Kim (2020)	CA	160	–	1960–2017	–	–	–	1. Arguments linking the benefits and costs of internationalisation and their implications for firm performance are deficient. 2. Limitations are observed in the conceptualisation and measurement of international diversification, performance, intangible assets, geographical contexts and research methodologies.

(*continued on next page*)

Table 7 (*continued*)

Study	Method	N	Sample	Period	PD[a]	Country effects	Curvilinearity diagnostics	Findings
								3. Eight recommendations are provided to address the research inconsistencies.
Purkayastha, Sharma, and Karna (2020)	SLR	111	–	2005–2014	–	–	–	1. Literature on ID-P is dominated by institutional theory, organisation structure and resource based view. 2. The lack of individual-level moderators is highlighted. 3. Multi-level studies on internationalisation are recommended.4. The need for research on emerging economy firms is highlighted.
Present study	HOMA/ MARA	187	Pearson's *r* and partial correlations	1974–2021	Yes	Yes	Yes: quadratic, cubic, and quartic terms.	1. The ID-P relationship is nonlinear inverted U-shaped. 2. High product diversification has a stronger negative moderation effect on ID-P relationship. 3. The ID-P relationship and moderation effect of product diversification varies across home-countries. Performance is higher among advanced country firms and lower in emerging country firms.

a. Moderating effect of product diversification on international diversification-performance relationship.
CA = Content analysis, HOMA = Hedges-Olkin type *meta*-analysis, MARA = Meta-regression analysis, HiLMMA = Hierarchical linear model *meta*-analysis, SLR = Systematic literature review, TR = Theoretical review.

SIC count (Denis et al., 2002). While the Herfindahl-type measure and entropy measures consider the share of a firm's sales across various industry segments (Tallman & Li, 1996; Wan, 1998), the SIC relatedness or SIC counts, as the name suggests, measures the mere presence of a firm's activities in different industry segments. Evidently, there is no clear guideline to categorise 'depth' or 'breadth' of product diversification. Since we were unable to test the independent effects of various categories of product diversification, our results provide only a rudimentary understanding of the moderation effect of product diversification on the relationship between international diversification and firm performance. Future studies are thus encouraged to test the interaction between various facets of international diversification and product diversification, and their implications for firm performance.

Second, it is difficult to conclude whether product diversification was an intentional decision or a causal effect of international expansion. It can also be true that firms initially invest in developing new products and then enter international markets (Hitt, Hoskisson, & Ireland, 1994). This limitation can be partly levied against sampling bias because several studies included in our sample do not provide detailed information on the host country location. An intriguing question that still requires scholarly attention is: which markets do diversifying firms choose to invest, and why? Thus, future research must address the modelling and sampling issues to provide a robust understanding of the diversification-performance relationship.

Third, our analyses suggest that future empirical studies on the ID-P relationship should consider integrating samples from diverse home countries. As indicated in Table 3, the majority of our sample studies focused on internationalisation by advanced economy firms. This characteristic of the literature is problematic because it gives us a biased perspective of the ID-P relationship and highlights the restrictions of the extant literature (Geleilate et al., 2016). Unlike emerging economy firms, advanced economy firms have access to superior intangible assets (Gubbi, Aulakh, Ray, Sarkar, & Chittoor, 2010). The main source of knowledge for advanced economy firms is their headquarters, whereas the learning for emerging economy firms largely takes place through their foreign subsidiaries (Awate, Larsen, & Mudambi, 2015). This gives an added incentive to emerging economy firms to diversify into new markets and procure knowledge that would otherwise be unavailable in their home countries. Moreover, the home country institutional environment and governance mechanisms determine the internationalisation patterns of firms (Singh & Gaur, 2009). Owing to the similar institutional environments, advanced economy firms tend to internationalise to other advanced economies (Gaur & Lu, 2007), whereas emerging economy firms first enter other emerging economies and gradually enter more advanced economies (Madhok & Keyhani, 2012). Evidently, home country context matters in the internationalisation pattern of firms and it is important that future studies address these theoretical and methodological issues. While having data from more countries would certainly enhance the findings (Geleilate et al., 2016), future studies are encouraged to expand our understanding by integrating new variables and theoretical frameworks.

6. Conclusions

In this paper, we sought answers to one of the most researched yet unresolved issues in the international business and management literature: How does international diversification affect firm performance? By using meta-analytical techniques, we were able to delve deep into the literature and reveal certain facts that can help us broaden our understanding of the topic but also pose new challenges for future researchers. In particular, we provide statistical evidence that the ID-P relationship is non-linear inverted U-shaped, and is moderated by product diversification with performance being higher in firms with low product diversity, and lower in firms with high product diversity. Moreover, our study highlights the importance of using appropriate measurement scales and adequate controls. To summarise, the ID-P literature is far from being considered a mature research field, and our findings provide key guidelines for future research.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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