



Internationalising high-tech SMEs: Advancing a new perspective of open innovation

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ABSTRACT

Choosing a foreign market entry strategy is known to be essential for firm internationalisation yet there is very little focus on the role, purpose, and value of open innovation for internationalising high-tech SMEs. A review of the international business, international entrepreneurship and international marketing literature combined with a bibliometric mapping of 2501 articles on firm internationalisation, suggests that research does not readily associate open innovation and the internationalisation of high-tech SMEs. This is regardless of open innovation's activities that can span over a firm's immediate geographical space. Thus, this study introduces new theoretical explanations and a midrange open innovation theory to advance open innovation as an alternative foreign market entry strategy especially for internationalising high-tech SMEs. This has theoretical and practical implications for academics, international business managers, and practitioners because it introduces an alternative internationalisation strategy for SMEs.

1. Introduction

International business research places great emphasis on selecting a market entry mode for overseas ventures. Within this research stream, a multitude of factors that are both positively and negatively associated with firm internationalisation have been mentioned (see Li et al., 2018; Qian et al., 2018; Reuber et al., 2018; Suh and Kim, 2012). This academic work includes research that spans over national boundaries and comparative studies focusing on domestic vs. international business activity across multiple nations (see Caputo et al., 2021; Casson and Li, 2022; McDougall and Oviatt, 2000). Within this body of work exporting, licensing, franchising, contracting, and outsourcing have been identified as the most frequently utilised strategies when firms decide to venture into overseas markets (see Bembom and Schwens, 2018; Brouthers et al., 2022; Mainela et al., 2018; Santos et al., 2021; Tolstoy et al., 2021). Elsewhere, international business studies have also highlighted issues and potential remedies for firm internationalisation (Hilmersson et al., 2021; Vendrell-Herrero et al., 2021). Within this body of work, firm

internationalisation is a concept utilised to describe a process whereby firms both increase their awareness of the direct and indirect influence of international transactions on their future, and establish and conduct economic transactions in other countries (Beamish, 1990; Alinasab et al., 2022). However and whilst research on this concept has provided necessary groundwork for international business researchers, international business managers, and practitioners helping them to explore the complexities of international business (Caputo et al., 2022; Lee et al., 2020), much more work on the role, purpose, and the value of open innovation (Chesbrough et al., 2006; Chesbrough, 2003; Chesbrough et al., 2018) as an alternative market entry strategy for internationalising high-tech SMEs remains to be done.

The lack of attention to the role, purpose, and value of open innovation as an entry mode for high-tech SMEs limits international entrepreneurship researchers' theoretical scope to traditional and overutilised concepts including, exporting, licensing, franchising, contracting, and outsourcing. Therefore, introducing open innovation as an alternative strategy for internationalising high-tech SMEs can advance

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firm internationalisation research. Since SMEs are widely regarded as one of the mechanisms that can be deployed to drive economic growth through their innovations, and the job opportunities they create across many parts of the global regions (Anyadike-Danes et al., 2009; Audretsch, 1995; Brown and Mason, 2014; Frenkel, 2012; Muller et al., 2015; Tether and Massini, 1998), knowledge about alternative strategies available to them for their internationalisation becomes important.

Besides the significance of their entrepreneurial activities to economies, prior research on open innovation in SMEs tend to concentrate on their liability of newness, outsidership and foreignness (Johanson and Vahlne, 2009; Parida et al., 2012), their lack of multidisciplinary competences (Bianchi et al., 2010), and less-structured approach to innovation (Vossen, 1998). This research approach overlooks open innovation's potential as a market entry strategy high-tech SMEs can choose to use if they decide to expand to overseas markets. Considering this research oversight and the essence of alternative internationalisation strategies for high-tech SMEs, there is an urgent need for new theorisations to inspire more work to focus on their internationalisation strategy from an open innovation perspective. To that end, we focus research attention on their international entrepreneurship activities (Brem et al., 2017; Herskovits et al., 2013) spanning over their immediate geographical space (Hilmersson and Johanson, 2015; McDougall and Oviatt, 2000). The following question is used to guide our research attention:

What is the role, purpose, and value of open innovation in the internationalisation process of high-tech SMEs?

Based on the requirements of this question, this conceptual work contributes to research in the following ways. First, the study develops and introduces theoretical explanations centred on open innovation to position it as a foreign market entry strategy high-tech SMEs can adopt. It contributes a midrange open innovation theoretical model illustrating open innovations' bridging effect for internationalising high-tech SMEs. In some way, the study proposes and theoretically extends the concept of open innovation setting an agenda for future studies on the overseas market entry strategies of internationalising high-tech SMEs. This is important in international entrepreneurship, international business, international marketing and SME research, because existing literature often associates open innovation with large, multinational technological firms (Chesbrough, 2003; Gassmann et al., 2010; Gnizy, 2019; Mortara and Minshall, 2011) that have surplus resources (Mubarak and Petraite, 2020). Other works elsewhere (e.g. Leckel et al., 2020) only pay attention to the concept of local open innovation as a means for public policy arguing that it increases collaboration for innovation in SMEs. We extend this work by introducing alternative theoretical explanations to account for SME internationalisation, in general, and high-tech SMEs in particular. Second, these theoretical explanations engender new knowledge at the intersection of open innovation and high-tech SME internationalisation. By integrating these two research streams, this study goes beyond the averages to offer new understanding of the role, purpose, and value of open innovation in the internationalisation process of high-tech SMEs.

Finally, the new theoretical explanations and a midrange open innovation model developed to account for open innovation in internationalising high-tech SMEs have implications for international entrepreneurship academics and international business managers and practitioners. For scholarly researchers, assumptions about open innovation and SME internationalisation inspire further research that examines ways in which it can be applied to provide market development and business expansion pathways for internationally-oriented SMEs. In the case of international managers and business practitioners, the new propositions and midrange open innovation model encourages the renewal and recalibration of the way they formulate their internationalisation strategies towards consideration of open innovation as a potential foreign market entry strategy (cf., Gao et al., 2020) and their internationalisation scope. Likewise, policy makers are challenged to find ways of harmonising policy and practice in order to support

firm-level activity, such as open innovation activities that can span over a firms' immediate geographical space.

2. Theoretical background

2.1. Firm internationalisation

Classic literature on firm internationalisation tends to focus on the speed, time period (Freeman et al., 2010; Knight, 2001; Knight and Cavusgil, 1996; Simba, 2013), volume of foreign sales (Oviatt and McDougall, 1995), and path and pattern of internationalisation (Johanson and Kalinic, 2016; Simba, 2015; Taylor and Jack, 2013). In the fields of international marketing and international management, the most prominent debate tends to be about the mode of internationalisation adopted by small firms (Dekel-Dachs et al., 2021; Melén and Nordman, 2009). As previously highlighted, this debate usually spotlights exporting, licensing, franchising, contracting, and outsourcing as common strategies that firms use in their internationalisation (see Brouthers et al., 2022; Welch and Luostarinen, 1988; Welch, 2015). Similarly, international entrepreneurship research points to innovation, vision, proactiveness, and risk-seeking behaviours as the main characteristics international entrepreneurs exhibit or adopt in unfamiliar markets as a way of creating value for their businesses that often span over their geographical space (McDougall and Oviatt, 2000).

Such characterisation of international entrepreneurs implicitly defines a generally accepted understanding of internationalisation as a firm-level activity that spans international boundaries (Jones and Coviello, 2005; Wright and Ricks, 1994). These conceptualisations of firm internationalisation, by scholarly research in the international business, international entrepreneurship, and international marketing fields are somewhat grounded in earlier studies that have focussed on, and debated about, the stages models of internationalisation (see Hult et al., 2020; Vahlne, 2020; Wach and Wehrmann, 2014; Zucchella et al., 2007). As an example, and despite its criticisms (see for example, Andersson, 2000; Bell, 1995), the Uppsala internationalisation model (U-Model) (Johanson and Vahlne, 1977, 2009; Johanson and Wiedersheim-Paul, 1975), which considers internationalisation as a process consisting of steps that start with a simple process of exporting and importing leading all the way to setting up a subsidiary in a foreign country as a firm becomes established, is often utilised as the foundation in the above mentioned research fields.

Although and despite such strong foundations that are anchored on the stages models much more work needs to be done to account for the role, purpose, and value of open innovation as an entry mode in the internationalisation process of SMEs. This indicates that international business research is due fresh perspectives and theoretical avenues to fill this knowledge gap. Accordingly, efforts to develop insights at the intersection of open innovation and high-tech SME international and a midrange open innovation theoretical framework provide an essential starting point for addressing such a gap.

2.2. Open innovation and SMEs

The literature at the open innovation and SME internationalisation nexus remains under-developed and as previously stated such knowledge is important given the reported roles of small firms in regional and national economic development (Leckel et al., 2020; Rothwell and Dodgson, 1992) and social transformation (Nguyen et al., 2015). Prior research on innovation (e.g., Nordman and Tolstoy, 2016) focuses on the connection between innovation relationships in SMEs and their performance in international markets. Elsewhere, international business studies tend to concentrate on comparing the internationalisation business models of SMEs such as traditional market adaptive, technology exploiter, and ambidextrous explorer (Child et al., 2017), the development of customer relationship management (CRM) strategies of SMEs (Melén Hånell et al., 2017), and business relationships (Tolstoy,

2019). Within this body of knowledge, studies on the role, purpose, and value of open innovation in the internationalisation process(es) of SMEs rarely feature due to perhaps some misunderstanding as suggested by Haddoud et al. (2021).

Nonetheless, recent studies have started to mention some connection between open innovation and SME internationalisation. As an example, the Santoro et al. (2021) multivariate study involving 1200 Italian firms, drew on the in-bound open innovation perspective to theorise how searching widely and deeply for new knowledge has an impact on the internationalisation performances of a firm with its age as a factor that enhances its international relationships. Similarly, Zucchella's (2021) study which took stock of three decades of international entrepreneurship research identify similar trends. Such research provides a window revealing a potentially mutual relationship between open innovation and internationalisation. Its insights signal that it is now necessary that academics and commentators of international business consider developing midrange open innovation theoretical propositions and/or models to begin serious investigations of its role, purpose, and value as an entry mode in the internationalisation process(es) of adventurous high-tech SMEs.

Generating new perspective at the intersection of open innovation and SME internationalisation will mark a shift from just narrowly focussing on open innovation as a mere output of in-bound and out-bound knowledge flows (Brunswick and Vanhaverbeke, 2015) towards its wider application to account for how it can also enable (or bridges) the internationalisation processes of small firms. For SMEs in general, open innovation has numerous benefits. Research shows that open innovation practices provide an alternative strategy whereby growth-oriented SMEs take advantage of inter-firm resources at a low cost (Greco et al., 2019; Van de Vrande et al., 2009). In addition, adopting an open innovation paradigm helps SMEs to account for obstacles including locational, technological and internal financial, and human resources that often impede new product development and access to new markets (Bigliardi and Galati, 2016; Chesbrough, 2003; Wynarczyk et al., 2013).

Furthermore, an open innovation paradigm ensures access to fluid information flows (Simba, 2015; Torkkeli, 2016), and specialised assets and equipment that would otherwise require SMEs to invest significant financial sums, knowledge, and human capital over several years (Chesbrough et al., 2006; Simba and Ndlovu, 2014). Considering that, generally, SMEs gain operationally through open innovation, it is plausible that those that are internationally-oriented can exploit it in their internationalisation context to enter into their targeted overseas markets. However, this seemingly notable potential appears to have somehow been ignored in international business research. Thus, this conceptual paper presents a comprehensive analysis of the wider international business research domain, newly formulated propositions, and a midrange open innovation theoretical framework to highlight the need for considering the role, purpose, and value of open innovation as an entry mode in the internationalisation strategies of small businesses, especially high-tech SMEs.

2.3. Operationalising open innovation as market entry mode

The argument being advanced in this conceptual paper draws on the open innovation and firm internationalisation literature. As illustrated in our comprehensive open innovation-firm internationalisation analysis, open innovation is rarely discussed as market entry strategy. Thus, to position it as a conduit enabling high-tech SMEs to venture into foreign markets, we elaborate on its role, purpose, and value for these SMEs. We perceive it as an essential market entry strategy for high-tech SMEs that can enable them to achieve their foreign expansion strategy. To position open innovation as a potent foreign market entry mode, we develop propositions, contained within the findings section, to theorise this utility.

3. Research approach

Considering the aims of this research, a traditional/narrative literature review approach (Cronin et al., 2008) and bibliometric mapping were considered suitable to aid the exploration of the status of research at the intersection of open innovation and high-tech SME internationalisation. As a tool for statistically evaluating research connections across publications (Mariani et al., 2021; Mariani and Borghi, 2019; Pritchard, 1969), bibliometric mapping provided an overview of research on SME internationalisation (see Fig. 1a and Fig. 1b).

Unlike a purely systematic literature review approach which sets parameters (e.g., time, space, and type) to guide literature search (cf., Dekel-Dachs et al., 2021; Terjesen et al., 2016), a traditional/narrative literature review strategy provided a wide research scope enabling the study to critique, summarise and synthesise a sizable base of secondary sources and develop new theorisations to advance knowledge on the role, purpose, and value of open innovation in the internationalisation process of high-tech SMEs. In addition to utilising bibliometric mapping techniques, the study benefited from sifting through secondary data gathered from a large pool of sources (Cronin et al., 2008) covering the fields of international business, international entrepreneurship, and international marketing to form the basis of the propositions for theorising open innovation's bridging effect in relation to high-tech SMEs' internationalisation process.

Most importantly, the study was able to incorporate seminal works including pioneering research on domestic versus international new ventures (INVs) (McDougall, 1989) and born-globals (Knight and Cavusgil, 2004; Rasmussen et al., 2001; Rennie, 1993) as an added baseline for grounding the core arguments about open innovation's bridging effect in high-tech SMEs' internationalisation. In some way, the study is consistent with Zucchella's (2021) recent research call to study international entrepreneurship and the internationalisation phenomenon, in the way it builds on existing knowledge about SME internationalisation to spotlight the need for future studies that pay attention on the role, purpose and value of open innovation as an alternative market entry mode for internationalising high-tech SMEs.

3.1. Data gathering

To generate a comprehensive outlook of international business research and highlight its main categories, data was gathered using *Web of Science (WoS)*—a widely used database covering a large base of secondary sources currently comprising 21,894 journal articles, books, and conference proceedings. Through using various combinations of key words e.g., 'Innovation', 'Internationalisation', and 'Open Innovation' with Boolean connectors including 'AND', 'OR', '*', and 'Plus' as recommended by Cronin et al. (2008), 2501 articles were generated.

The search primarily focused on studies in management, business studies, and economics covering empirical and conceptual research. By taking advantage of a freely available VOS viewer software, the research produced a co-occurrence map (Fig. 1a), and overlying visualization map (Fig. 1b). Fig. 1a illustrates the relatedness of various research items on internationalisation in international business, international entrepreneurship and international marketing research based on the research articles in which they appear together. As demonstrated in this figure (Fig. 1a) there is no notable direct conduit linking open innovation with SME internationalisation. Clearly, in the internationalisation cluster (top right-hand side) comprising items, that is, articles that have focused on internationalisation, strategy, expansion, entry, networking and so on, open innovation has not been mentioned. Likewise, within the open innovation cluster (top left-hand side), internationalisation rarely feature. This demonstrates that there is a gap in international business research whereby open innovation and internationalisation are treated separately.

Consistent with Fig. 1a, Fig. 1b illustrates that within the blue patches, the keywords utilised for the purpose of this research were less

a) Map of a co-occurrence network

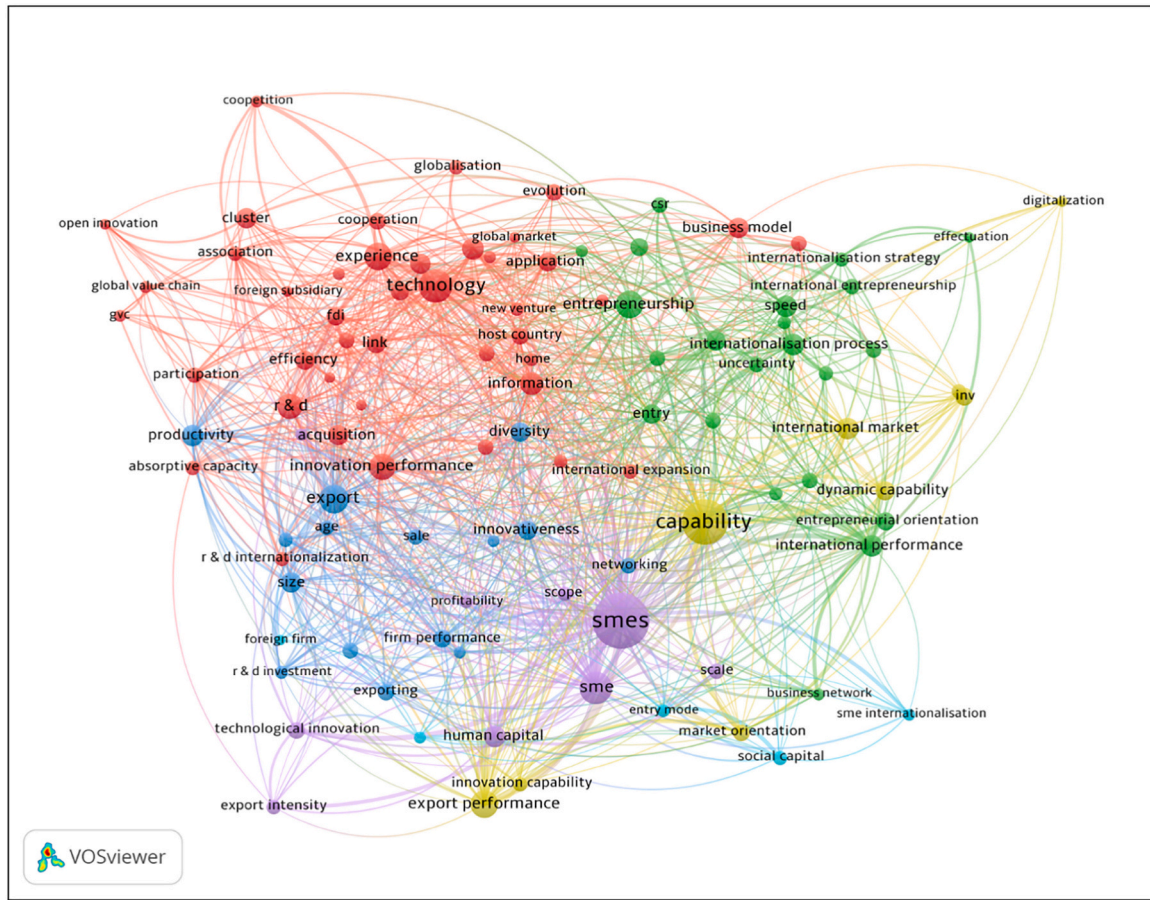


Fig. 1a. Map of a co-occurrence network.

utilised, but the yellow warmer colour indicates that open innovation, international performance, SME internationalisation, entrepreneurial orientation, social capital, and co-opetition seem to be gaining some attention within the international business domain and are gradually attracting scholarly interest. This suggests that they are likely to become the next subjects of interest in international business research and thus will advance new knowledge development in a rather neglected area of research connecting open innovation and international entrepreneurship nexus.

4. Findings

4.1. The role of open innovation and the internationalisation of high-tech SMEs

The concept of accelerated internationalisation is often applied as a way of distinguishing born global firms or INVs (Oviatt and McDougall, 2005) by underlining that, unlike other firms, they begin to internationalise soon after their inception (Freeman et al., 2010; Freeman and Cavusgil, 2007; Simba, 2015). In that context, acceleration refers to the rapid pace with which born globals or INVs internationalise following their inception when compared to earlier generation of firms (Johanson and Kalinic, 2016; Knight and Cavusgil, 1996; Kuivalainen et al., 2007; Rennie, 1993). Research suggests that born global firms or INVs are entrepreneurial companies that are often small or medium sized (Henart, 2014) and they are typically characterised by their innovative nature and global mindset (Gerschewski et al., 2018). These types of companies see the entire world, rather than merely their domestic

market, as their marketplace.

Research focusing on international business points to several strategies that enable the acceleration of such firms (see Wach and Wehrmann, 2014). Amongst the identified strategies networking has been suggested as an important strategy that can enable the rapid acceleration of firms into foreign markets (Bangara et al., 2012). The general view within this body of knowledge is that, networking and expanding through forming partnerships provides firms alternative routes for accessing international resources and markets as well as enhancing their success (Johanson and Mattsson, 2015; Mathews and Zander, 2007).

However, this assumption tends to be skewed towards the context of more established enterprises with large resource bases capable of supporting and sustaining their overseas ventures. Plus such companies often consider internationalisation as one of various strategic choices they can make (Calof and Beamish, 1995; Morais and Ferreira, 2020; Nguyen and Kim, 2020; Paul and Gupta, 2014; Rana et al., 2021). Notably and within this debate, the context of high-tech SMEs is not accounted for, yet their flexibility and ability to draw on external resources in their bid to counterbalance their resource deficiencies can provide them opportunities to rapidly expand into foreign markets (cf., Zahoor et al., 2021; Zucchella, 2021). However, the problem seems to be that even those studies that focus on open innovation in SMEs only discuss how it improves their overall performance outlook (Hossain and Kauranen, 2016; Schwens et al., 2018) and how local/national OI systems are critical for SMEs' growth and development (e.g., Leckel et al., 2020). Thus, to carry on looking at open innovation from that perspective discounts the benefits of globalisation including integrated markets, harmonised trade, synchronised information systems and

phenomenon better captured through the processes of ambidexterity (see Ferreira et al., 2021; O'Reilly and Tushman, 2008; Voss and Voss, 2013).

Undoubtedly, the process of exploration and exploitation taking place in an innovation milieu (Dezi et al., 2018; Nooteboom, 2003) or territory (Torkkeli, 2016), either domestically or internationally, with open innovation taking precedence (Porter et al., 2005) can provide the leverage high-tech SMEs need to rapidly extend their operations to overseas markets (cf., Moellers et al., 2020). Existing international business studies recognise that the purpose of open innovation in SMEs is to allow them to grow and expand their markets (Chesbrough et al., 2018; Simba, 2013; Van de Vrande et al., 2009). Within this literature, adopting an open innovation strategy is known to attract inflows of knowledge from anywhere in the world and any new product, process, or service can potentially be employed in any geographical context (see Moellers et al., 2020; Sekliuckienė et al., 2016).

In geographical contexts that are beyond their boundaries, open innovation provides SMEs opportunities to participate in global knowledge networks comprising international partners (Simba, 2013; Simba and Ndlovu, 2014; Torkkeli, 2016). The literature on networking acknowledges that globalised networks help internationally-oriented firms to foster international relationships (Cooke et al., 2018; Simba, 2013) and to rapidly adapt their internal structures in alignment with the overseas markets they chose to enter. They also promote them to develop capital of international relations as well as to easier and faster estimate the potential of opportunities provided by the international market (Sekliuckienė et al., 2016). In a sense, open innovation serves as a mechanism for reducing negativity and thus helping to expedite firm internationalisation (Gassmann et al., 2010).

Research elsewhere shows that firms that are open innovation-oriented have a high likelihood of generating better networking capabilities that can be vital for their international expansion strategy (Bianchi et al., 2010; Gao et al., 2020). However, and whilst open innovation seems to be this important, it is surprising that research on the purpose of open innovation is still lacking nearly two decades since Dana et al.'s (2004) research call. Thus we propose the following to advance knowledge at the open innovation and high-tech SMEs internationalisation nexus.

Proposition 2a. Open innovation supports the internationalisation strategy of high-tech SMEs through fostering productive international partner relations.

Proposition 2b. Open innovation enables high-tech SMEs to leverage on their international relations to gain new capabilities, markets, and business opportunities that would otherwise be difficult to access.

4.3. The value of open innovation in the internationalisation of high-tech SMEs

Value creation in firms is known to be enhanced when they gain access to new assets (Penrose, 1959), capabilities (Teece, 2018), and knowledge bases (Nooteboom, 2003). A combination of such resources presents them with essential competitive dynamics that underpin their competitive advantage (Laursen and Salter, 2006; Moellers et al., 2020; Teece, 2014). Existing scholarly works readily acknowledge the importance of assets, capabilities and knowledge repositories as important factors in value creation for the firm (Barreto, 2010; Michaelis et al., 2021; Teece, 2019; Zahra et al., 2006). Related to that, the literature on networking suggests that for firms seeking to enhance their competencies, networks can provide a pool of resources that are both tangible and intangible (Huggins and Johnston, 2010; Lau and Bruton, 2011). Therefore, it is plausible to claim that firms that engage in various collaborations as prescribed by the open innovation paradigm (Chesbrough et al., 2006), enable them and their collaborators to jointly capture and create value for their operations as well as their markets (Chesbrough et al., 2018; Gao et al., 2020; Pirkkalainen et al., 2018).

Considering the context of internationally-oriented SMEs such as those involved in the high-technology sector continually seeking to review internal resources, capabilities, and knowledge bases, open innovation functions as a catalyst as well as a strategy for market entry.

Indeed, and given that open innovation described in Porter et al. (2005) as 'open science' can be valuable for internationalising firms as it can strengthen their capacity enabling them to venture into overseas territories and to simultaneously tap into essential resources while exploiting market opportunities. Elsewhere scholarly research suggests that open innovation activities help to compensate for the lack of innovation resources within enterprises by improving their innovation capabilities (Clauss, 2017; Sun et al., 2020). If that is the position in the literature, there is reason to assume that in the context of SMEs that are internationally-oriented, especially high-tech SMEs, open innovation practices (Chesbrough, 2003; Van de Vrande et al., 2009) can be a way of compensating for their liability of foreignness (Santos et al., 2021) as they provide them with an instructive framework for engaging in productive collaborations (Barrena-Martínez et al., 2020; Simba, 2013). Thus, such firms can leverage on open innovation to boost their overseas venture(s) as they can access more ideas and technologies from outside and yield more internal knowledge, as well as reduce innovation costs, accelerate time-to-market, and share risks with other partners (Eli et al., 2020; Hervas-Oliver et al., 2021; Pustovrh et al., 2020; Rothaermel and Deeds, 2004).

Failure to consider value creation and capture in internationally-oriented high-tech SMEs will make it difficult for them to understanding open innovation and its impact on their internationalisation (Chesbrough and Appleyard, 2007). Accordingly, and building on Chesbrough and Bogers (2014) conceptualisation of open innovation as 'a distributed innovation process based on purposively managed knowledge flows across organisational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organisation's business model' an argument about open innovation as a value-adding activity in internationally-oriented high-tech SMEs is warranted (also cf., Chesbrough et al., 2018). Thus, we propose that:

Proposition 3a. High-tech SMEs can leverage open innovation to fulfil their strategic choices of venturing into overseas markets.

Proposition 3b. Open innovation is a value-adding activity that aids the internationalisation processes of high-tech SMEs by enabling them to enter foreign markets.

4.4. An open innovation model for high tech-tech SME internationalisation

Fig. 2 illustrates the centrality of open innovation in the internationalising high-tech SMEs. The main assumption in Fig. 2 is that an open innovation paradigm provides a baseline strategy for internationally-oriented high tech-tech SMEs. Contrary to research that focusses on the narrow view of open innovation as purely a mechanism of in-bound and out-bound activities of innovation (Brunswick and Vanhaverbeke, 2015; Parida et al., 2012), Fig. 2 accounts for the role, purpose and value in promoting the internationalisation of high-tech SMEs. Its three core facets capture the internationalisation of high-tech SMEs and elaborates them through open innovation activities associated with productive international partnerships (relationships with individuals, other organisations, and institutions) and international resources (market intelligence, assets, financial capital, human capital, and knowledge capital, etc).

An important underlying assumption illustrated in Fig. 2 is that international partnerships unlock access to international resources and markets that high-tech SMEs would otherwise not have been able to through conventional inbound and outbound activities of innovation (cf., Brunswick and Vanhaverbeke, 2015). Moreover, establishing productive relationships in their selected overseas destinations forms an important bridge for high-tech SMEs to leverage essential capabilities,

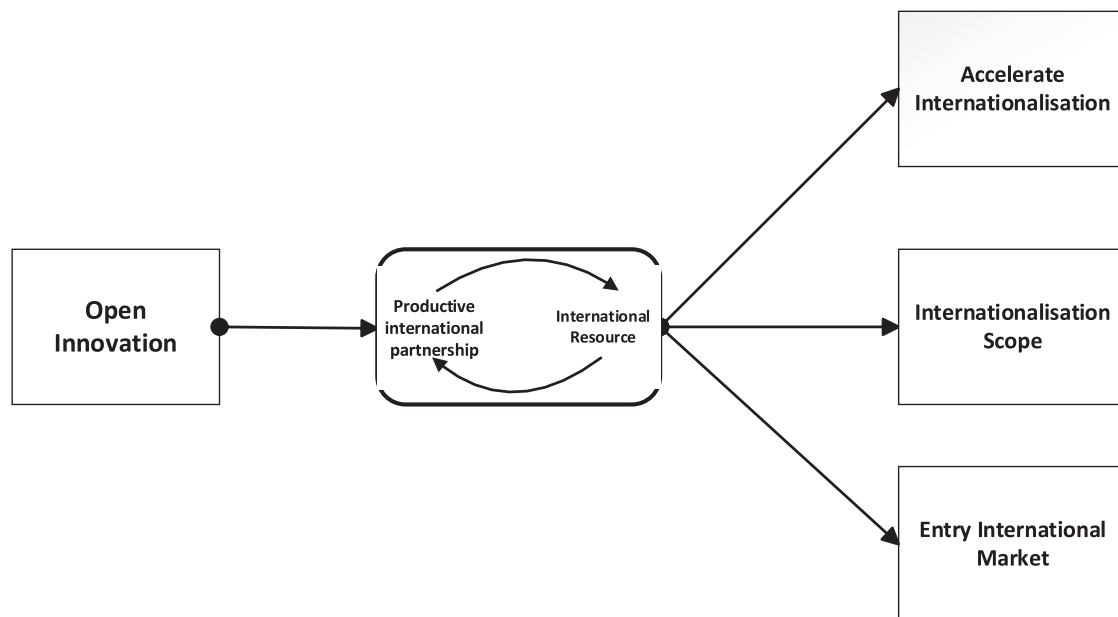


Fig. 2. Open innovation and internationalising high-tech SMEs.

markets, resources and business opportunities. Thus, this study contends that such an open innovation bridge creates a path for high-tech SMEs to enable their rapid acceleration into overseas markets of their choice (cf., Freeman et al., 2010). Furthermore, not only does the open innovation bridge unlock crucial resources, but it also enhances their internationalisation scope. That is, the open innovation bridge has the effect of diminishing issues that are often associated with the liabilities of newness, outsidership, and foreignness (Aliaga-Isla and Aliaga-Isla and Rialp, 2013; Drori et al., 2009; Gurău et al., 2020) of internationalising SMEs, thereby increasing chances of open innovation-based international strategy to succeed. Indeed and as a value-adding activity (see Brem et al., 2017; Herskovits et al., 2013), open innovation presents internationalising SMEs with new possibilities that can meaningfully assist them to reduce international strategy failure for their ventures often debated in the international business literature (see for example, Lee et al., 2020). Such understanding is important, but often under-emphasised in international business research and yet it is fundamental to SME internationalisation.

5. Discussion

The core argument extended in this research centres on the role, purpose, and value of open innovation in the internationalisation of high-tech SMEs. Since the open innovation paradigm was first mentioned in Chesbrough's (2003) works, its potential bridging effect for internationalising SMEs especially high-tech SMEs, has been largely overlooked. But, and considering that open innovation fosters connections amongst individuals, firms, and institutions in new and deliberately established local innovation milieus and other geographically dispersed territorial paradigms of innovation spanning international boundaries (Torkkeli, 2016), there is ground to claim that internationalising SMEs can leverage open innovation to support their international strategies (cf., Moellers et al., 2020; Sekliuckienė et al., 2016).

Arguably, open innovation provides a pathway not only for the fast development of SMEs (Sekliuckienė et al., 2016), but also for expediting their entry into overseas markets of their choice. Given their increasingly recognisable and commonly reported economic roles in the international business fields that were once dominated by multinational enterprises (MNEs) (Cooke et al., 2018), open innovation positions internationally-oriented SMEs as serious contenders. Consistent with

that view, Child et al. (2022) added that, though historically SMEs have been less internationally-engaged than large firms, the imbalance is rapidly shifting. Increasingly SMEs, including born globals and INVs, are active competitors in global markets and participants in global supply chains. The point being advanced here is an important one in that the internationalisation of high-tech SMEs leads to many positive societal outcomes including knowledge acquisition, R&D intensity and expenditure, international knowledge transfer, increase in the number of patents possessed, and availability of commercial knowledge (local/foreign knowledge) (Dai and Liu, 2009). Therefore, and in considering this study's efforts to advance an open innovation bridge as a conduit for the internationalisation of high-tech SMEs not only offer understanding about the role, purpose, and value of open innovation in a new light, but also heralds a shift from just narrowly focussing on open innovation in the context of inbound and outbound activities of innovation (Brunswick and Vanhaverbeke, 2015).

Considering that the wider literature on international business, international entrepreneurship, and international marketing does not account for open innovation's bridging capacity, understanding of its function as a market entry accelerator for SMEs is yet to develop. Perhaps the lack of its development is due to misunderstanding as suggested by Haddoud et al. (2019). Accordingly, research efforts to develop open innovation perspectives by positioning it as an integral part of the internationalisation process of high-tech SMEs can, on the one hand, motivate new research whilst, on the other hand, address research calls for more scholarly works on the international expansion of high-technology SMEs (Dana et al., 2004). Crucially, such research efforts induce new theorisations that help to account for the understated function of open innovation as a baseline for the international strategies SMEs can, and should, adopt for their overseas business ventures.

Furthermore, the purpose of open innovation in internationally-oriented SMEs, such as those that operate in technology industries, is largely ignored. As an example, international business research frequently mentions that open innovation enables the sharing and exchange of resources in connected communities (Porter et al., 2005; Santoro et al., 2021) overlooking that while open innovation allows productive relationships to form, it can simultaneously act as a channel for internationally oriented SMEs to jointly craft their strategies for venturing into overseas markets. In some way, conceptualising open innovation as a market entry strategy anchored on productive

relationships, especially international relationships, can be the cornerstone for the successful implementation of a market entry strategy by internationally-oriented SMEs.

Considering the context of high-tech firms and their orientations (often mirrored by INVs or born globals—see Knight et al., 2004; McDougall and Oviatt, 2000), applying an open innovation paradigm (Chesbrough, 2003; Chesbrough et al., 2006) in the way they operate forms an integral component in their process of crafting their internationalisation strategies. Crucially, and as previously stated, open innovation can function in ways that reduce operational obstacles arising from liabilities associated with foreignness, newness, size, and outsidership of firms that venture into overseas markets (Aliaga-Isla and Aliaga-Isla and Rialp, 2013; Buckley, 1989; Drori et al., 2009; Guráú et al., 2020) and thus, promoting SME internationalisation. Indeed, the presumed purpose of open innovation engendered through productive international relationships in high-tech SMEs cannot be understated, especially in today's markets that are characterised by enduring political turmoil, economic instability, pandemic outbreaks, and natural disasters. Accordingly, and regardless of the obstacles embedded in contexts of high uncertainty, an open innovation bridge can assist internationalising SMEs to boost their acceleration into overseas markets of their choice because of the value it creates for their internal processes.

It is notable though that, before an open innovation paradigm matures into a mechanism that facilitates productive engagements amongst participating individuals, firms, and institutions (Chesbrough et al., 2018), a process of due diligence often precedes partnership formation (Granovetter, 2005; Burt, 2004; Zaheer and Bell, 2005). Thus, and for internationalising high-tech such a process underpins how they build and develop key and valuable components of their internationalisation including capabilities, competences, and even trust (Simba, 2015). The new perspectives and framework advanced in this research hold theoretical and practical implications for several stakeholders.

The propositions and the midrange open innovation theoretical framework presented in this paper raise theoretically-driven questions for international business, international entrepreneurship, and international marketing researchers requiring them to consider open innovation as a market entry mode for internationally-oriented SMEs, particularly those that operate in technology industries (cf., Chesbrough et al., 2006). Thus, developing and extending understanding on the role, purpose, and value of open innovation in a way that they can be incorporated into the internationalisation strategies (Andersen, 1997; Andersson, 2000) (of high-tech SMEs) introduces new theorisations that more fully account for open innovation's bridging effect in international SMEs. Arguably, such an approach contributes to classical models of internationalisation like the U-Model, which is based on the assumption that firms do not try to find international opportunities (see Johanson and Vahlne, 1990) rather, they are available to export when they receive the first foreign request (Autio and Sapienza, 2000).

In some way, positioning open innovation as an entry mode for SMEs venturing into foreign markets aligns with Prashantham's (2005) ideas about a knowledge-based conceptualisation of internationalisation.

The materialisation of such theorisations means that more empirical research that utilises variable contexts becomes necessary (cf., Dana et al., 2004). That is important for advancing an open innovation perspective in international business, international entrepreneurship and international marketing fields and SME research. Crucially, depicting open innovation as an internationalisation strategy for SMEs develops new literature at the open innovation/SME internationalisation nexus. Thus, this paper provides an alternative dimension of open innovation contrary to research that has purely concentrated on innovation as an activity that involves inbound and outbound information inflows and its management (Brunswick and Vanhaverbeke, 2015). The new knowledge at the open innovation/SME internationalisation enriches understanding on the market expansion and entry modes providing some explanations regarding the behaviours and actions of

internationally-oriented high-tech SMEs.

In addition to the above mentioned theoretical implications, the new propositions and the midrange open innovation model have profound practical implications. For international business managers they provide insights and an instructive model detailing what they need to consider when crafting their overseas market entry strategies. Business practitioners gain new insights that reveal information about the need to look beyond innovation as simply a source for new product development (NPD) and improved commercial performance (Zhu et al., 2019) towards considering as an entry mode into overseas markets. Most importantly, the new positions and framework can inspire them to see open innovation as a value-adding activity for their internationally-oriented SMEs. Similarly, policy makers are encouraged to find ways of harmonising policy and business practice to support firm-level activity that transcends international borders.

5.1. Limitations and suggestion for future research

Similar to any other research, this study has limitations. Although, and by adopting the principles of a traditional/narrative literature review, the study was able to generate sizable data through canvassing large bases of secondary sources; it is hard to claim that it analysed all the studies on SME internationalisation and open innovation. Nonetheless, the way it synthesised, analysed, and critiqued the literature on SME internationalisation, open innovation, and innovation provided several areas of possible further inquiries.

First, the midrange open innovation theoretical framework it presents provided scope for future studies to empirically explore the relationships of its variables. Such an approach can lead to important contributions to international business, international entrepreneurship, and international marketing and SME research as it helps to contextualise the variables of the new midrange open innovation theoretical framework which is consistent with Zahra's (2007) call for contextualising theory development in entrepreneurship research. Moreover, such contributions align with recent research on developing indigenous theories to account for variable context (see Bruton et al., 2021).

Furthermore, contextualisation in theory building can generate important insights leading to better understanding of the dynamics of variable overseas markets internationalising high-tech SMEs may choose to establish their operations; thus, enriching the international strategy development literature stream in international business research. Second, the propositions offered in this study provide another research avenue. Particularly, the theoretical propositions can motivate exploratory research to advance the role, purpose, and value of open innovation for internationalising high-tech SMEs in various ways. Such research will provide deep understanding of the underlying mechanisms of an open innovation paradigm that internationalising high-tech SMEs leverage on to bolster and craft robust international strategies. That level and depth of understanding can advance new perspectives on open innovation's bridging effect in relation to overseas market entry, expansion of operations, and business development.

6. Concluding remarks

This research demonstrated the potential of open innovation in enabling high-tech SMEs' internationalisation. To that end, it developed open innovation propositions and a midrange open innovation model for rationalising the internationalisation process of internationally oriented SMEs. In some way, the research advanced open innovation as a baseline for international strategy development in SMEs. Arguably, the way open innovation's bridging effect articulated in the study distinguishes its role, purpose, and value as an overseas market entry, expansion, and business development paradigm (cf., Chesbrough et al., 2018). Thus providing an alternative theoretical dimension to a concept that seems to have been debated through a binary lens of inbound and outbound

activities of innovation (Brunswick and Vanhaverbeke, 2015; Parida et al., 2012). Crucially, the study showed how the new conceptualisation of open innovation as an international market entry strategy SMEs can adopt is important for their internationalisation in several ways.

First, the study contributes to international business, international entrepreneurship, and international marketing, and SME research by the way it provides alternative perspectives of open innovation to account for how internationalising high-tech SMEs can and should utilise open innovation when entering overseas markets of their choice. Second and most importantly the study effusively positions open innovation's bridging as an integral component of the of international strategy development in internationalising high-tech SMEs. Third, the debate focusing on the open innovation/SME internationalisation nexus develops new knowledge which enriches understanding on the possibilities open innovation provides for internationally-oriented SMEs that perceive the global marketplace as a destination for their activities.

CRediT authorship contribution statement

Amon Simba: Conceptualization, Writing – original draft, Writing – review & editing. **Mahdi Tajeddin:** Formal analysis, Conceptualization, Funding acquisition. **Mehdi Farashahi:** Conceptualization, Writing – original draft. **Léo-Paul Dana:** Supervision, Validation. **Amirhossein Maleki:** Conceptualization, Writing – review & editing.

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Data availability

No data was used for the research described in the article.

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