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# Do technology-focused fast internationalizers' performance measures change as they mature?

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## ABSTRACT

We examine how technology-focused innovation-based fast internationalizers' (TIFIs') performance measures change as they mature. Based on 42 interviews with Australian entrepreneurs and industry experts, we show that young TIFIs employ exploratory strategies for developing cutting-edge solutions and prefer using subjective measures for assessing their export performance. Later, becoming more complex organizations, employing exploitative strategies, they use additional objective, profit-based measures. The implications of destructive forces (e.g., COVID-19) to the performance of these firms were modest. Due to being digitally-based industry disruptors, they remain focused on innovation as the source of their independence and survival. Their creativity drives constant change/disruption to industries, requiring back-and-forth movement among exploratory and exploitative strategies, integrating subjective and objective performance measure simultaneously, as their new-to-the-world solutions are developed to withhold 'creative destruction' over time.

## 1. Introduction

While in international business (IB) literature numerous studies have used various performance measures (for overviews, see e.g., Dahooie, Meidute-Kavaliauskiene, Vanaki, Podvieszko, & Beheshti Jazan Abadi, 2020; Huang, Zhu, Zhang & Ding, 2021), considerable inconsistencies exist (Ibeh, Jones & Kuivalainen, 2018; Wright, Roper, Hart & Carter, 2015). Furthermore, the existing measures are heavily criticized. Dahooie et al. (2020: 2350) state: "no definitive, unambiguous framework has yet been developed for how to measure firms' export performance". Madsen and Moen (2018: 381) conclude: "lack of a non-ambiguous measurement of export performance has hampered the theoretical as well as managerial advancement of the field". According to Sadeghi, Chetty, et al. (2021: 667), "it is not clear how managers make sense of success and define it in their actual practices, and what dimensions are involved in their assessments". Besides lacking consensus regarding suitable measures, existing ones do not reflect changes during firms' evolution. Thus, the studies ignore that firms change as they mature, and that the measures may need to be adapted (Sadeghi, Rose & Madsen, 2021).

Additionally, research that focuses on multinationals cannot be automatically generalized to smaller internationalizers – including born globals (BGs), international new ventures (INVs) and other fast internationalizers (FIs). These firms are common in technology-intensive industries (Rialp-Criado, Galván-Sánchez & Suárez-Ortega, 2010), where their competitive advantage is based on the ability to develop and maintain unique know-how and follow a niche-focused and proactive international strategy (Nordman & Melén, 2008). On the other hand, such a strategy creates dependency on specific technologies or products (Almor, 2013; Øyna et al., 2018), leads to market saturation and outdated products/processes and puts organizational pressure on firms to overcome threats to their survival and performance as they mature (Freeman, Deligonul & Cavusgil, 2013). Despite efforts to measure fast internationalizers' performance, research is inconsistent (Efrat & Shoham, 2012; Ingley & Wafa, 2016) and the results mixed (Freixanet & Federo, 2022; Huang et al., 2021). In line with Romanello and Chiarvesio (2019), we suggest that the sporadic and fragmented nature of the research on TIFIs would benefit from a more in-depth understanding of their longitudinal use of performance measures.

We know from the resource-based view (Barney, 1991; Wernerfelt,

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1984) that TIFIs' continued survival depends on the exploitation of their resources and capabilities (Teece, Pisano & Shuen, 1997) and value creation (McDougall, Shane & Oviatt, 1994) by securing and developing new technologies (Kriz & Welch, 2018; Øyna et al., 2018). Thus, these firms constantly need to innovate, learn and expand technological capabilities which will ensure their capability to introduce new products faster and create (explore) and harvest (exploit) new IB opportunities as they mature.

Although considerable literature focuses on early internationalization triggers and initial growth (for overviews, see Freixanet & Federo, 2022; Steinhäuser, Paula & de Macedo-Soares, 2021), there is less evidence on mature firms' subsequent developments (Crespo, Simões & Fontes, 2020; Romanello & Chiarvesio, 2019) and, especially, performance (Braunerhjelm & Halldin, 2019; Freixanet & Federo, 2022). In line with earlier research (Richard, Devinney, Yip & Johnson, 2009; Sadeghi, Rose et al., 2021), we think that performance measures should align with firms' goals. Therefore, we conclude that there is still not enough evidence on whether maturing TIFIs evaluate their performance similarly to young TIFIs.

Taking the above-mentioned gaps into account, we examine the research question *how do TIFIs' performance measures change as the companies mature?* This allows us to respond to calls for more research on organizational performance measures (Huang et al., 2021; Sadeghi, Rose et al., 2021), technology-focused firms (Nemkova, 2017; Øyna et al., 2018) and maturing TIFIs' development processes (Almor, Tarba & Margalit, 2014; Freixanet & Federo, 2022).

We take a critical view on earlier research on TIFIs and export performance measures, drawing insights from the International Entrepreneurship (IE) and IB literature. We especially focus on the appropriateness of performance measures for maturing TIFIs in the less understood post-establishment (international growth/consolidation) phase that follows the critical (pre-start-up and early international development) phase (Trudgen & Freeman, 2014). Our data originate from Australia, well known for its technology-intensive cluster (Freeman et al., 2013; Kriz & Welch, 2018). By examining 37 heterogeneous TIFIs, we provide insights into the changes in performance measures used over time.

We contribute theoretically by drawing from the conceptualization of 'creative destruction' (Schumpeter, 1942), to show how digitally-equipped and technology-focused entrepreneurs operating in fast moving industries withstand the intensity of global competition. Their business model is innovation-based because they are disruptors (Spencer & Kirchoff, 2006) and drive change through creative destruction of existing technologies and processes. We also expand existing literature on the dynamics in export performance measurement in the volatile, uncertain, complex and ambiguous (VUCA) environment in which TIFIs must operate as they evolve by developing dynamic capabilities (Teece et al., 1997). We show that TIFIs differ because they continuously create new industry segments. Finally, we explain why, contrary to studies on the negative impact of the pandemic on firms' performance (Al Amosh & Khatib, 2023; Jordaan, 2023), COVID-19 did not affect their export performance: as TIFIs must respond continuously to environmental dynamics, they become more resilient than their competitors (Linnenluecke, 2017). We conclude with propositions, managerial implications and future research avenues on addressing the complexity of TIFIs' performance measurement.

## 2. Critical view of existing literature

### 2.1. Characteristics of technology-focused innovation-based fast internationalizers (TIFIs)

Our focus is on TIFIs, characterized by high international orientation, high proactiveness and lower perceptions of internationalization risks but also technological innovativeness, unique know-how, niche focus, and creative destruction (Komlos, 2016; Schumpeter, 1942):

constant strategic renewal and knowledge development (see also Table 1).

TIFIs' business environment is relatively unstable: responding to foreign competitors' actions and changing customer needs is a continuous challenge (Odlin, 2019; Yang & Gabrielsson, 2017). Especially exporters from smaller economies face market saturation quickly (Kriz & Welch, 2018; Sadeghi, Chetty, et al., 2021), first-mover advantage is considerable, but in a limited time frame (Øyna et al., 2018; Odlin, 2019). Therefore, TIFIs must constantly look ahead and develop new knowledge to meet future needs (Kriz & Welch, 2018; Riviere & Suder, 2016). Consequently, *their business model should encompass repeating/overlapping cycles of technological 'creation' through new product development as an 'exploration' strategy; and an 'exploitation' strategy of existing products (Spencer & Kirchoff, 2006) to maintain their technological competitive advantage and financial survival.* Due to this constant turbulence over time, *TIFIs may need to adapt the use of performance measures to follow the changes in their business environment.* However, this aspect has been mainly ignored in previous research, although recent studies demonstrate that *entrepreneurs' mindset changes over time* (see, e.g., Bruneel, Gaeremynck & Weemaes, 2022).

Fast and extensive international market expansion in competitive sectors implies that TIFIs are continuously introducing new products and 'creating' new markets that simultaneously result in the 'destruction' of other products and sectors (Spencer & Kirchoff, 2006; Odlin, 2019). The cumulative effects of ongoing competitive pressures of international market selection and new-to-the-market technologies in product development affect the selection of performance measures over time.

Relying on the above, we postulate that creative destruction helps to explain why TIFIs rely on innovation and R&D. Maturing TIFIs will increase their chances of remaining independent and do well financially if they can continue growing through *successive cycles of 'exploration' and 'exploitation' strategies.* This implies the use of different export performance indicators, as firms mature (Sadeghi, Rose et al., 2021).

**Table 1**

Characteristics of TIFIs vs. slower, less technology-focused and less innovative internationalizers.

TIFIs	Slower, less innovative internationalizers
<ul style="list-style-type: none"> <li>• early and rapid internationalization</li> <li>• high international orientation</li> <li>• high proactiveness</li> <li>• lower perceptions of internationalization risks</li> <li>• high uncertainty tolerance</li> <li>• high entrepreneurial capabilities</li> <li>• unique know-how</li> <li>• first movers</li> <li>• focused on narrow market niches</li> <li>• a few competitors; some of them are not easy to identify</li> <li>• high-value offerings, less standardized products</li> <li>• high technological innovativeness</li> <li>• high digitalization</li> <li>• continuous knowledge and product development</li> <li>• active strategic renewal</li> <li>• unstable and very dynamic business environment</li> <li>• constantly changing customer needs</li> </ul>	<ul style="list-style-type: none"> <li>• later and slower internationalization</li> <li>• lower international orientation</li> <li>• lower proactiveness</li> <li>• higher perceptions of internationalization risks</li> <li>• lower uncertainty tolerance</li> <li>• lower entrepreneurial capabilities</li> <li>• less unique know-how</li> <li>• followers</li> <li>• focused on mass markets</li> <li>• many competitors; it is relatively obvious who they are</li> <li>• lower prices, standardized products</li> <li>• lower technological innovativeness</li> <li>• lower digitalization</li> <li>• less active knowledge and product development</li> <li>• less attention on strategic renewal</li> <li>• more stable, less dynamic business environment</li> <li>• more stable customer needs</li> </ul>

Sources: based on Almor, 2013; Cavusgil & Knight, 2015; Crick & Crick, 2014; Efrat & Shoham, 2012; Freeman et al., 2013; Graebner & Eisenhardt, 2004; Knight & Liesch, 2016; Komlos, 2016; Odlin, 2019; Øyna et al., 2018; Rialp et al., 2005; Romanello & Chiarvesio, 2019; Riviere & Suder, 2016; Trudgen & Freeman, 2014; Yang & Gabrielsson, 2017; Zhou, 2007; Zucchella, Strange & Mascherpa, 2019

## 2.2. Export performance indicators

Consensus on what is (successful) export(ers') performance is missing (Vissak, 2023). For instance, Falahat, Knight and Alon (2018) and Sadeghi, Rose et al. (2021) measured the achievement of the firm's goals, while Kirpalani and Ghauri (2015) understood performance as a dichotomy: success or failure in international markets. Leonidou, Katsikeas and Coudounaris (2010: 87), in turn, stated that it can be understood as "the outcome of the firm's export marketing strategy".

Export performance measures are commonly classified as *subjective* (based on managers' assessment) or *objective* (based on financial indicators) measures (Sadeghi, Chetty, et al., 2021; Zucchella, Strange & Mascherpa, 2019). Such indicators have also been categorized into financial, operational and achievement of goals (Gerschewski & Xiao, 2015; Gerschewski, Rose, & Lindsay, 2015), financial, operational and overall effectiveness (Huang et al., 2021; Ibeh et al., 2018), financial and nonfinancial (Gerschewski et al., 2020; Sadeghi, Chetty, et al., 2021), financial and strategic (Falahat et al., 2018; Moen et al., 2022) or economic and non-economic (Dahooie et al., 2020) measures. These combinations are more fine-grained versions of the subjective/objective dichotomy.

Next, we provide an overview of measures used in existing research. We do not distinguish between studies on fast internationalizers (FIs), exporters or SME internationalizers as often the separation of these research streams is not straightforward due to conceptual and definitional inconsistencies.

### 2.2.1. Objective measures

As with broader IB literature (Hult et al., 2008), *financial measures* like return on equity (Zahra, Ireland & Hitt, 2000), investments (McDougall et al., 1994), assets and sales (Lu & Beamish, 2004; Pangarkar & Yuan, 2022) still dominate efforts to assess firms' performance (Braunerhjelm & Halldin, 2019; Huang et al., 2021). Mudambi and Zahra (2007) highlight that such measures may be inappropriate for firms that simultaneously face liabilities of foreignness and youth. Moreover, profitability might be less suitable for maturing firms that invest heavily into R&D (Øyna et al., 2018) in parallel with market penetration (Jiang et al., 2020). Finally, return-based financial measures do not account for differences between firms' overall and export performance (Sousa, 2004). This is an important shortcoming for measuring TIFIs' performance as they can also have substantial domestic activities.

*Growth-based measures*, such as sales growth (Fariborzi, Osiyevskyy & DaSilva, 2022), export growth and export profitability growth are popular (Choquette, Rask, Sala & Schröder, 2017; Falahat & Migin, 2017) but lack explanatory and predictive power (Westhead & Wright, 2011; Wright et al., 2015). Moreover, they are less useful for younger firms (Mudambi & Zahra, 2007; Trudgen & Freeman, 2014). For mature firms, achieving continuous growth can also become problematic when their technology or products become outdated (Øyna et al., 2018). TIFIs may become locked into ongoing cycles of new product development (Odlin, 2019; Odlin & Benson-Rea, 2017). They need resources (networks, alliances, unique technology), technological (Rodríguez & Rodríguez García, 2005) and other capabilities (Cavusgil & Freeman, 2007; Teece et al., 1997) to survive and mature (Braunerhjelm & Halldin, 2019). Thus, for measuring their performance, growth-based indicators are insufficient.

Additionally, many scholars have used *other objective measures*: number of markets (Choquette et al., 2017; Jeong & Yang, 2023), export sales/volume (Ganotakis, Konara, Kafourous & Love, 2022), export share (Sleuwaegen & Onkelinx, 2014; Dong, Kokko & Zhou, 2022), (relative) market share (Hughes, Cesinger, Cheng, Schuessler, & Kraus, 2019; Sadeghi, Rose et al., 2021) and survival (Mudambi & Zahra, 2007; Øyna et al., 2018). These measures also have limitations. Some start-ups aim to be acquired (Almor et al., 2014; Richard et al., 2009), thus survival is not always a sign of success. Furthermore, measuring market share is complicated for TIFIs active in niche, specialized and complex markets

(Almor, 2011; Moen, 2002). Achieving considerable sales can temporarily worsen profitability due to increased sales-related costs (Shoham, 1998). Besides, changes in the business environment can affect such indicators considerably (Chen, Sousa & He, 2019; Freeman et al., 2013).

### 2.2.2. Subjective measures

Many scholars have used subjective or *perceptual measures* – e.g., perceived overall performance (Hult et al., 2008), international success (Ibeh et al., 2018) and satisfaction with various internationalization aspects (Donbesuur, Zahoor & Boso, 2022; Kalinic & Brouthers, 2022) – either separately<sup>1</sup> or to complement objective ones (Sousa, 2004; Stoian, Rialp & Rialp, 2011). However, such measures lack reliability due to recall bias (Styles, 1998). Moreover, both 'success' and 'failure' are subjective (Sadeghi, Rose, et al., 2021; Vissak, 2023) and the firm's context matters (Evers, Gliga & Rialp-Criado, 2019; Nummela, Saarenketo & Loane, 2016). Finally, in addition to differences in resources and capabilities, firms' assessments can vary depending on their founders' commercial or technical (Nordman & Melén, 2008), local or immigrant background (Morgan et al., 2018; Ong et al., 2022) or positive vs. negative previous export experience (Axinn, 1988; Welch & Welch, 2009) and cognitive attitudes (Freeman & Cavusgil, 2007; Freeman et al., 2013).

Performance measures should align with firms' goals (Trudgen & Freeman, 2014), and therefore, some scholars have used *achievement of goals* (Knight & Cavusgil, 2004; Sadeghi, Rose, et al., 2021). However, it lacks reliability due to different or changing goals it is compared against (Richard et al., 2009; Sapienza, Smith & Gannon, 1988): firms' goals differ (Freixanet & Federo, 2022; Spyropoulou, Katsikeas, Skarmas & Morgan, 2018) due to the managers' different background or previous export experiences (Nummela et al., 2022) and change due to management or ownership changes (Welch & Welch, 2009) or turbulence in the economic environment (Nudurupati et al., 2021). Moreover, effectual entrepreneurs, common among TIFIs (Yang & Gabrielsson, 2017) lack pre-determined goals regarding, for example, expected returns but also the target markets as they feel that the future is unpredictable: they act based on their knowledge, identity and network relationships instead of conducting a predictive analysis (Sarasvathy, Kumar, York & Bhagavatula, 2014; Vissak, Francioni & Freeman 2020).<sup>2</sup> Finally, subjective measures are not good predictors of future export growth (Madsen & Moen, 2018).

### 2.2.3. Combined measures

Using only a few performance indicators can be problematic due to their narrow focus, low explanatory and predictive value (Ibeh et al., 2018; Wright et al., 2015), potentially leading to premature conclusions (Cerrato & Fernhaber, 2018). To overcome these problems, several authors have suggested using a mix of objective and subjective measures (see, for instance, Ibeh et al., 2018; Trudgen & Freeman, 2014).

There is still no consensus on which combination to select and whether to use different combinations for measuring different firms' performance (see also Fig. 1). Thus, it is almost impossible to conclude whether the contradictory findings are due to true variations in the data or the variance of export performance measures (Leonidou et al., 2010). We agree with Madsen and Moen (2018) that the diversity of export

<sup>1</sup> This is not always theoretically motivated: some scholars have used such indicators due to firms' reluctance to share their financial information (Crespo et al., 2020; Evers et al., 2019; Kalinic & Brouthers, 2022) or because of lacking access to suitable objective data: in some countries, firms do not have to provide detailed export data in annual reports (Martin, Javalgi & Ciravegna, 2020; Sadeghi, Rose & Madsen, 2021).

<sup>2</sup> For instance, according to Crick and Crick (2014), such firms may have a broad vision, but their goals for achieving this vision may change. Weerawardena, Mort and Liesch (2019) found that most of their studied firms did not clearly perceive their final product and market segment.

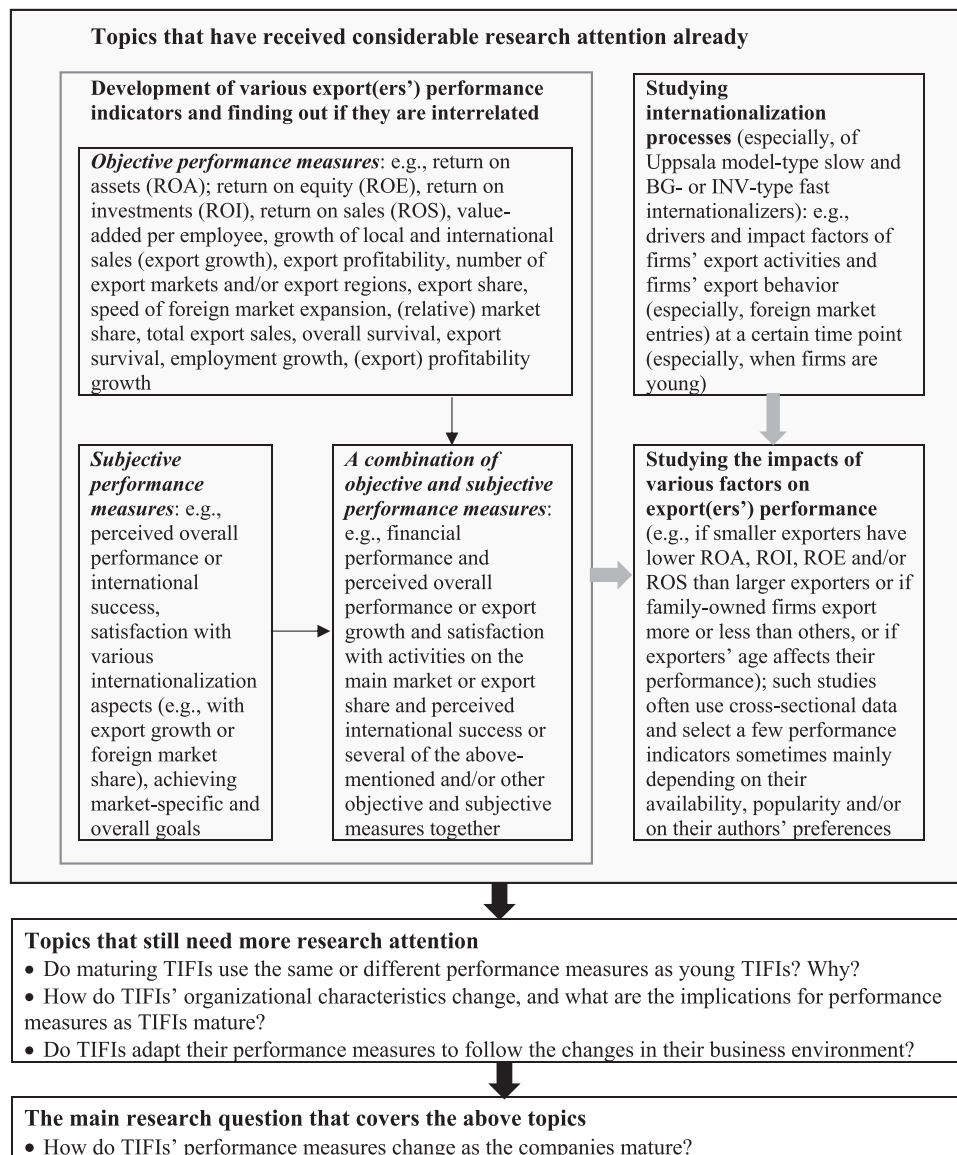


Fig. 1. Fast internationalizers' performance: an overview of research gaps and previously studied areas.

performance measures is a challenge for further research on the topic.

Although researchers have applied diverse performance measures, most studies have been cross-sectional by nature and at least the authors of this paper are not aware of earlier studies which would have investigated the use of performance measures over time. In our empirical study, we will focus on which measures would be most suitable for TIFIs. Furthermore, we investigate whether they continue using the same measures throughout their internationalization process or not.

### 3. Methodology

This study investigates TIFIs' performance measures and aims to understand how they change as the firms mature. When studying a new phenomenon of which little prior knowledge exists, Edmondson and McManus (2007) recommend inductive theory development with qualitative research design. Performance measurement is complex and complicated further by the numerous factors simultaneously affecting TIFIs; this and the need to study performance measures within their natural context encouraged us to choose a qualitative research design (Piekkari et al., 2009; Sadeghi, Chetty, et al., 2021).

We selected Australia as the research context as Australian TIFIs have

a relatively small home market; thus, growth-oriented firms need to internationalize early. We collected the data by in-depth interviews and located the interviewees through various Australian government websites and national and state level chambers of commerce. To obtain a comprehensive understanding of TIFIs' performance and provide a contextualized explanation, we continued our data collection until no new insights emerged (Saunders et al., 2018, Saunders & Townsend, 2016), resulting in 37 interviews with managers and five interviews with industry experts.

Our literature review guided the selection criteria of the informants. Interviewed managers represented TIFIs which had internationalized within three years since inception, and had reached an *international sales ratio of 25 per cent or more within three years since inception*. To take the temporal context of the phenomenon into account, we conducted the interviews over a longer period of time, including both economically stable and unstable times. A summary of the informants and information about data collection is provided in Table 2.

In-depth open-ended interviews lasted on average for 1.5–2 h. We transcribed and stored the files in a project data file that also included secondary data (website materials, firm memos, meeting agendas and field notes). Next, we summarized the informants' perceptions of

**Table 2**  
Summary of the informants and their background\* .

Informant and time of interview	Interviewee (role)	Leading-edge technology-focused product/service	Firm characteristics			Current markets	Development phase
			Size	Age* *	Initial markets		
1 DesTech (Sept. 2014)	Co-owner	High-tech design travel clothing, web-based	2 full-time	< 1/ < 1	U.S.	U.S.	Critical development
2 NetSupply (Sept. 2009)	Owner	Web-based sourcing applications	3 full-time	2/1	U.S. and UK	U.S. and UK	Critical development
3 HomeFind (Sept. 2009)	Owner	Web-based housing solutions for international students	1 full-time, 2 assistants	< 1/ < 1	Korea, China, and Hong Kong, China	Korea, China, and Hong Kong, China	Critical development
4 TechApps (Oct. 2009)	CEO	Computer peripheral devices, digital applications, web-based	25 full-time	6/1	Europe	Europe	Post-establishment
5 AusCAD (Oct. 2009)	Owner	Industrial & graphic CAD solutions, digital applications, web-based	20 full-time	6/1	Asia	Asia	Post-establishment
6 WebDev (Apr. 2018)	Co-founder/ Director	Online tech games & developer, digital applications, web-based	20 full-time	7/1	U.S., EU, China, Japan & worldwide	U.S., EU, especially France & Germany, Russia, Taiwan, Japan, the Netherlands, Sweden	Post-establishment
7 Gas-Oil Solutions (Apr. 2018)	Director	Gas and oil power solutions, technology-based	10 full-time	8/3	Botswana, Myanmar, UK	Botswana, Myanmar, UK	Post-establishment
8 Monitor-Dev (Apr. 2018)	Sales Manager	High quality monitoring devices (gas-oil industry, digital applications)	15 full-time	8/1	Indonesia, Vietnam	Mostly Asian markets: Indonesia, Malaysia, Vietnam, Thailand, Singapore, Japan	Post-establishment
9 InterAct (Aug. 2009)	Senior Manager	Video game designs and developer, digital applications, web-based	90 full-time	14/1	U.S. and UK	U.S. and UK	Post-establishment
10 TechMin (May 2018)	Director	Diamond manufacturing (mining exploration), technology-based	25 full-time	14/1	West & South Africa (15–20 markets)	West & South Africa, New Zealand, Finland, India, Chile, Ecuador, Vietnam, Chile	Post-establishment
11 TechEd (May 2018)	Director, International Consultancy	Online education in trade, investment and policy, digital applications, web-based	120–150 full-time	16/1	Cambodia, Pacific, South East Asia, South Asia	Africa, Namibia, U.S., South America, Central Asia	Post-establishment
12 ProMote (Aug. 2009)	Marketing Director	Systems engineering training, digital applications, web-based	5–10 full-time	17/1	Western countries	Western countries (extensive)	Post-establishment
13 TechCuts (Apr. 2018)	Managing Director	High-end quality beef cuts	10 full-time	25/1	Japan, South Korea, U.S.	Japan, U.S., New Zealand, Singapore, Middle East	Post-establishment
14 Techfoods (Apr. 2018)	Senior Administrator	High quality specialized horse feed manufacturer, technology-based	40 full-time	30/1	Singapore, New Zealand, South Korea	Singapore, New Zealand, Mauritius, Bahrain, Maldives, > 25 markets	Post-establishment
15 SalTech (May 2020)	Senior Export Manager	Vertical integration (aquatic sperm breeder), technology-based	12,000 (State) 250 (State Head Office)	33/3	Japan, Hong Kong, China, Taiwan	China, Hong Kong, China, Taiwan, Indonesia, Singapore, Malaysia, Vietnam	Post-establishment
16 DataNet (Aug. 2020)	CEO	Big data storage, mining & monitoring, digital applications, web-based	12 full-time / 4 part-time	9/1	U.S.	U.S., Europe & other advanced markets	Post-establishment
17 HealthNetTech (Aug. 2020)	Founder, Director	Specialist health care products, web-based	12 full-time	27/1	U.S.	U.S.	Post-establishment
18 EngineeringTech (Aug. 2020)	Co-founder, Business partner	Online game development, digital applications, web-based	32 full-time	10/1	U.S.	U.S.	Post-establishment
19 TechTraining (Sept. 2020)	Founder, CEO	Professional development training, digital applications, web-based	8 full-time / 6 consultants	9/1	Philippines, South Korea, South America, Vietnam, Ukraine, India, Italy	Philippines, South Korea, Malaysia	Post-establishment
20 AISoftware (Sept. 2020)	Co-founder, CEO	AI Software & big data storage/ analysis, digital applications, web-based	40 full-time	5/1	U.S., Japan	U.S., Japan	Post-establishment
21 MicroTech (Sept. 2020)	CEO	Industrial biotechnology	21 full-time	21/1	U.S., Western Europe, Latin America	U.S.	Post-establishment
22 OceanTech (Sept. 2020)	MD	Sea aquatic technology and production	10 full-time / 3 part-time	10/1	Hong Kong, Singapore	Hong Kong, Singapore, China	Post-establishment
23 ComDevProjects (Sept. 2020)	CEO	Community-based projects – mining sector	13 full-time	13/1	Kenya, Malaysia	Papua New Guinea, Kenya, Malaysia	Post-establishment

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Table 2 (continued)

Informant and time of interview	Interviewee (role)	Leading-edge technology-focused product/service	Firm characteristics			Current markets	Development phase
			Size	Age* *	Initial markets		
24 ElectroTech (Oct. 2020)	CEO	Electronics – defense and mining	220 full-time	25/1	U.S., New Zealand	U.S., Europe, New Zealand	Post-establishment
25 HealthSportsTech (Oct. 2020)	CEO	Hygiene products, web-based	22 full-time / 4 part-time	9/1	New Zealand	UK, U.S., New Zealand, Asia, EU & global	Post-establishment
26 WebCosmetics (Aug. 2020)	CEO	High end skin care, web-based	40 full-time	25/1	UK	UK, U.S. and Western Europe	Post-establishment
27 ArchTech (Oct. 2020)	MD	Architectural services, digital applications	240 full-time–local 800 full-time – globally	30/1	UK	UK, U.S., China, Asia	Post-establishment
28 LightTech (Oct. 2020)	CEO	Infrastructural lighting	20 full-time	30/2	South East Asia, Vietnam	South East Asia, India	Post-establishment
29 EngLogistics (Aug. 2020)	MD	Logistics, platforms – defense, digital applications	20 full-time	12/1	UK, U.S.	UK, U.S., China, South America	Post-establishment
30 DigitalConsult (Sept. 2020)	CEO	Advanced data management and marketing, digital applications, online	12 full-time	19/1	Saudi Arabia	Saudi, Norway, Germany, Canada, UK, U.S., Pacific Islands [22 countries]	Post-establishment
31 SeaFoodProcess (Sept. 2020)	Director	High-end, dried-seafood products and advanced process	3 full-time & seasonal casuals	9/1	Hong Kong, China, Australia	Hong Kong, China, Singapore, Australia	Post-establishment
32 EquistTech (March 2021)	CFO	E-commerce, advanced-technology manufacturer of equestrian ligament products, online	14 full-time	6/1	U.S., Indonesia	U.S., Europe, Indonesia	Post-establishment
33 AgriTech (Feb. 2021)	CFO	High-end dairy products	3000 + full-time	6/1	U.K., Europe	100 +Asia, Africa, Middle East, Pacific Islands, China	Post-establishment
34 IndustAccess (March 2021)	MD	High-end e-commerce industrial steps & ladders, digital applications	5 full-time	22/3	U.K., Middle East, Ireland	U.K.	Post-establishment
35 MinTech (March 2021)	CFO	High-end rare earths mining, advanced technology	1000 + full-time	30/1	West & South Africa, U.S., Latin America	Africa, U.S., Latin America, Philippines	Post-establishment
36 SanitTech (Feb. 2021)	Director	Specialized high-end manufacturer of water sanitary equipment, digital applications	33 full-time	43/1	Slovakia, Eastern Europe, U.S.	Saudi Arabia, Middle East, Eastern Europe, U.S., Greece, Italy, Malaysia	Post-establishment
37 ManufTech (March 2021)	Joint Co-Director	Specialized high-end manufacturer and e-retailer of natural fiber clothing, online	16 full-time	16/1	U.S., U.K.	U.S., U.K.	Post-establishment
Industry Expert 1: Austrade (Aug. 2009)	Senior Advisor	Automotive and advanced manufacturing	n.a.				
Industry Expert 2: Austrade (Sept. 2009)	Senior Advisor	High-technology industries					
Industry Expert 3: State Government (Nov. 2009)	Director	Department of Innovation, Industry & Regional Development					
Industry Expert 4: Australian Exporters Club (Oct. 2009)	Director	n/a					
Industry Expert 5: Foreign MNE based in Australia (Nov. 2009)	Board Member/ Former academic	Agribusiness					

\* - Firms' names were changed to retain their anonymity.

\* \*-The first numeral shows the firm's age at the time of the interview, the second shows the age when the firm internationalized.

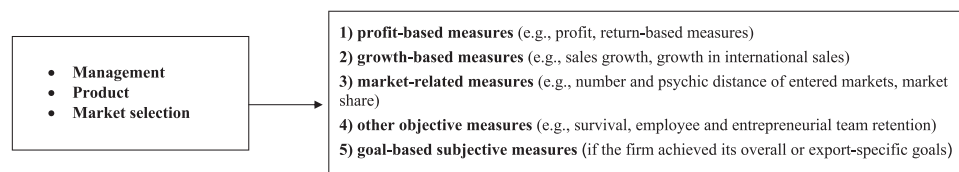


Fig. 2. First-order themes.

performance measures to derive a list of first-order themes displayed in Fig. 2.

In line with the mainstream of qualitative research, the data collection and analysis were tightly intertwined. The research question guided the analysis process which started with systematic data reduction (Miles & Huberman, 1994). In the first round of the coding process, we focused on the different types of performance measures and classified them inductively into groups. Thereafter, these were linked with the phase of the company (young/mature) to identify a pattern. Finally, we matched the identified patterns with theoretical explanation (Sinkovics, 2018).

We integrated the data analysis with discussion of individual performance measures followed by investigation of factors which influence their appropriateness. This analysis revealed extant efforts to measure maturing TIFIs' performance as being too simplistic, with a need to take several factors into account simultaneously. Of particular significance, the concept of a *critical development* (pre-start-up/venture creation and early international entry/ development) *phase* where a unique set of performance measures is required emerged from the analysis, while we identified some *additional* performance measures in the *post-establishment* (international growth and consolidation) *phase* (Freixanet & Federo, 2022; Trudgen & Freeman, 2014). Further refinement of the primary and secondary data led to the development of the second-order themes (Magnani & Gioia, 2023) and sub-themes presented in Fig. 3. Some additional illustrative quotes for each sub-theme are provided in Appendix 1.

#### 4. Findings

In our analysis we focus on five broad groups of indicators: 1) profit-based measures, 2) growth-based measures, 3) market-related measures, 4) other objective measures and 5) goal-based subjective measures.

#### 4.1. Profit-based measures

Profit-based measures are seldom appropriate for new ventures (Mort & Weerawardena, 2006; Sadeghi, Rose, et al., 2021). This was confirmed in our interviews: initial internationalization requires investments, which in the short term drain the firm's profitability. *Industry Expert 3* explained that financial performance may not be applicable until 3–5 years after initial internationalization due to the time it takes to sign deals and generate cash flow.

Use of profitability as a performance measure was challenged by McDougall and Oviatt (1996) who suggested that new ventures may focus on obtaining a foothold in the market. We support this argument: a manager who is looking for profit in the early stages of internationalization is likely to be disappointed. Further, low profit may signal that a firm is investing in its future: "often it takes 2–3 or 4 years until you get yourself established /.../ until you get a return" (*Industry Informant 4*).

On the other hand, operational profitability remains important beyond the post-establishment phase. *DigitalConsult*, now in their 12th year, claimed: "I can't really remember a time when I wasn't worrying about the next pay run". They have only made a profit in "the last three years". Due to future investments in R&D, challenges with profitability would continue, although the company would meet its objectives.

Profit-based measures are also problematic for TIFIs because initial expansion to psychically distant markets will create an imbalance between returns and costs (Barkema & Drogendijk, 2007; Melén Hånell & Nordman, 2019). Our interviewees stressed that entry to distant markets was based on long-term objectives, not short-term returns (*HomeFind*, *AusCAD*, *ProMote*) and that immediate returns are almost impossible to create due to cultural differences (*ProMote*, *DataNet*).

A weakness of profit-based performance measures is also their sensitivity to external influence: fluctuating exchange rates, macroeconomic trends and global financial and economic crises, like the dot-com

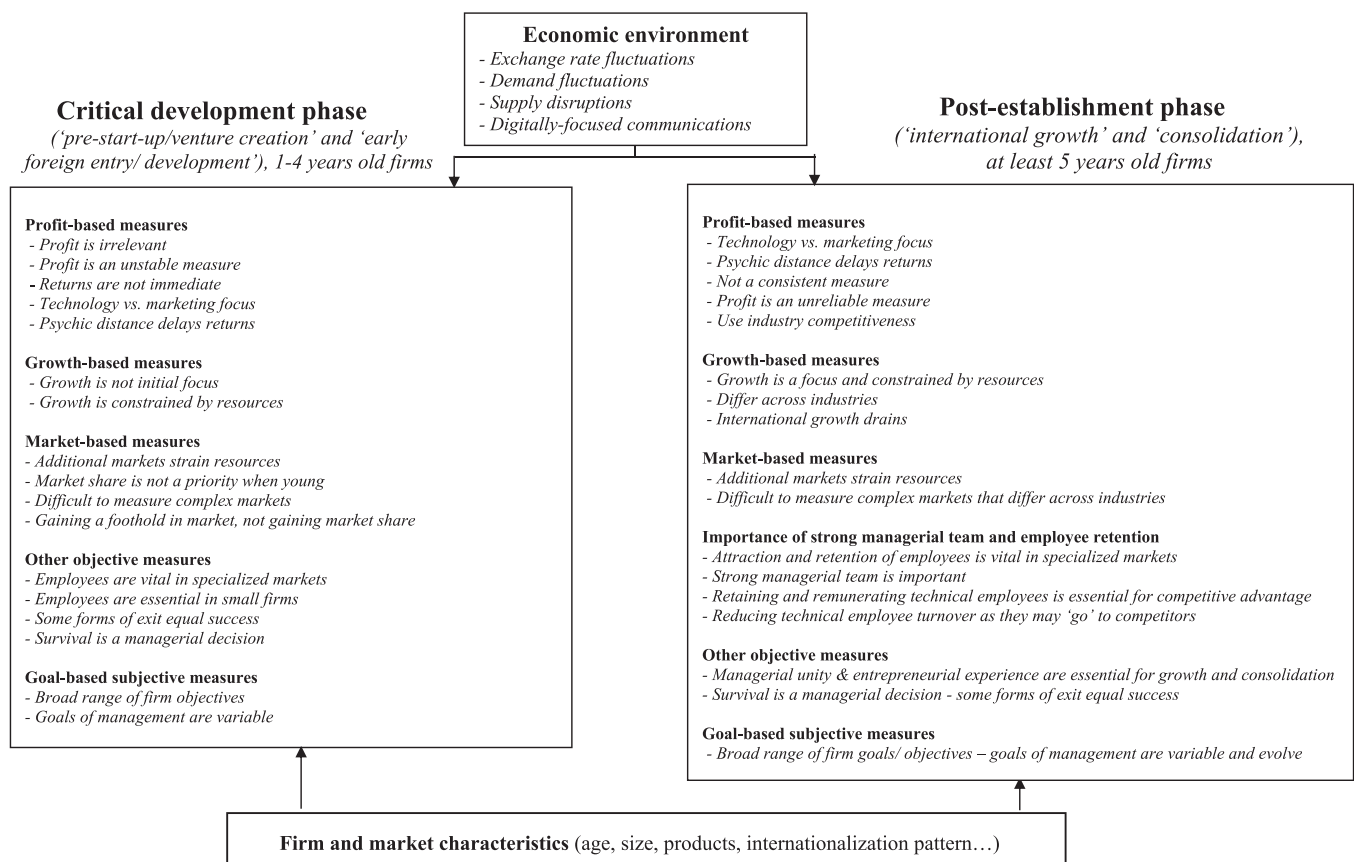


Fig. 3. Second order themes.

crisis in 1999/2000, the 2008/2009 global financial crisis or the recent COVID-19 pandemic. Highlighting the global financial crisis in 2009, *InterAct* stressed that the biggest determinant of profit was fluctuations in the exchange rates: “We’re 100% export /.../ the currency exchange rates alone mean more difference to our profit margins on making a game than almost any other factor.” This makes profit unstable and especially unreliable for TIFIs with considerable earnings from unstable economies.

Assessing TIFIs’ profit is challenging in many respects. We learned from our interviewees that although TIFIs’ financial prospects might look promising, the situation may change abruptly (*AgriTech*, *ArchTech*, *OceanTech*). Furthermore, the external triggers do not treat TIFIs equally: e.g., the impact of COVID-19 was less severe for digitally-focused firms with online operations in developed economies. On the other hand, their performance is always relative and should be evaluated against firms who operate in the same markets.

Making provisions for macroeconomic trends, *Industry Informant 3* suggests assessing firm performance relative to other firms within the same markets: “if they were able to say /.../ in the global financial crisis, the markets have fallen by  $x$  % but our earnings have remained steady”.

Furthermore, time is important. Some interviewees did not use return-based measures at all (*NetSupply*, *DesTech*, *HomeFind*, *AusCAD*). Many TIFIs use a *pre-start-up* phase to generate ideas, assess opportunities, and seek resources, which affects their post-founding return-based measures. *DesTech*’s objective was to capitalize on their pre-existing foundation to achieve relatively quick profits. Before commencing production, they had already obtained crowdfunding and invested in “concept testing and product design” using a well-known ‘Kickstarter’ website enabling them “to obtain finances and pre-orders for the product”. They believed these efforts should translate “into faster realization of profits [once]...operations commenced”.

The industry experts also found return-based measures inappropriate. However, larger, mature firms considered these indicators essential in assessing their performance (*ProMote*, *TechApps*). Thus, we do not categorically refute the appropriateness of return-based and other financial measures but reinforce the view that TIFIs are heterogeneous (Freeman & Cavusgil, 2007; Melén Hånell & Nordman, 2019).

#### 4.2. Growth-based measures

TIFIs internationalize while still small and resource-constrained. Growth-based measures including sales growth (Zahra et al., 2000), growth in international sales (Contractor, Hsu & Kundu, 2005) and profitability growth (Zhou, 2007) feature heavily in efforts to measure firms’ performance. Although some interviewees supported the use of growth-based measures (*AusCAD*), their applicability depends on numerous factors, including the economic environment and firm-level expectations and goals (*ElectroTech*; *ProMote*).

We found some support for growth-based measures in assessing TIFIs’ performance with *AusCAD* (post-establishment phase, 6 years old), declaring that international growth is a priority. “I don’t really like the ‘returns on’. Our focus /.../ is much more around profit margins, sales growth, foreign sales growth, and the stock price”.

However as with financial return, the applicability of growth-based measures is affected by numerous factors. Firm age, focus on international growth and resources emerged as important factors influencing the selection of growth-based measures.

According to Bruneel et al. (2022) and Mudambi and Zahra (2007), young firms are fragile and focus primarily on survival and development (e.g., innovation) rather than pursuing financial performance; mature firms become more growth-oriented. *ProMote* (post-establishment phase) strongly illustrates this argument. At inception, it focused on developing high quality innovative technology-based products and services. However, later, it became growth-focused: “the strategy is definitely growth”.

In further support for the inclusion of growth-based measures

(Knight & Cavusgil, 2004), *Industry Informant 5* promotes the importance of growth. However, in doing so, the issue of age once again emerges: “it depends where you are on the cycle of growth, but eventually some measure of growth in sales /.../ growth in license fees of royalties or whatever. But it’s got to be growth in some cash flow measure, I mean, it has to be”.

TIFIs operate in highly specialized markets where the lack of a domestic market forces them to internationalize to grow (e.g., Øyna et al., 2018; Spencer & Kirchhoff, 2006). Some informants stressed that they do not make any difference between sales from home or international markets (*Industry Expert 2*), even if it would strain their resources and create managerial problems (*Industry Expert 3*).

Distinguishing TIFIs from domestic small businesses, *Industry Informant 2* emphasized “If it’s a born global, the sales and foreign sales are the same” meaning that to grow, firms expand their international operations, therefore increasing export intensity. Taking very small firms’ resource constraints into account, *Industry Informant 3* stated that international growth can rapidly drain resources: if “they are like 3 years old and they’ve got 100% export and they’re absolutely all over the place then you’d want to be looking at what their resources are, and it might be that they’ve got a lot of financial backing /.../ to support those export operations. But if they haven’t then...”.

According to Chetty and Campbell-Hunt (2003), explosive growth can place enormous strain on firms’ resources and create managerial problems. Supporting this, *ProMote* (post-establishment phase) revealed that while growth was desired, the limited human resources weakened the firm’s ability to expand rapidly: “it takes time and certain actions also in terms of the growth of our organization, in terms of picking trainers /.../ We have a standard that we want /.../ that’s the basis of the success of the organization”.

In comparison, a mature TIFI (*HealthNetTech*) considered growth-based measures very appropriate as a massive rebranding and marketing overhaul was required to respond quickly to the COVID-19 pandemic, by expanding rapidly into new markets and increasing activities in existing foreign markets. Similarly, another mature TIFI (*HealthSportsTech*) found growth-based measures suitable to assess their performance in the post-COVID-19 turbulence. However, firms are unique in their goals. Depending on their objectives, growth-based measures may not be appropriate, illustrated by *TechApps*: “we wanted maximum growth very, very quickly. That’s not to say that another company maybe with a different type of product could choose the other way. I don’t think there’s any right or wrong way”.

In theory, in this later post-establishment phase revenue and profit margins are likely to be higher and multiple overseas markets may be viewed as a strength, offering a safeguard against downturns in one market or region. However, our findings indicate that growth-based measures may only be appropriate to TIFIs after at least three-four years from inception as firms should accumulate resources and capabilities to support further growth. However, the exact time frame depends on industry and market factors.

#### 4.3. Market-related measures

Taking BGs’ unique strategy into account, Mort and Weerawardena (2006) used ‘entry into multiple markets’. However, our informants did not consider this a key performance measure: some stressed the importance of successful entry to a single lead market (e.g., the US for *MicroTech*), while entry to other markets would happen later. Sometimes competitive reasons or limited resources (*LightTech*) may drive TIFIs to focus on a few markets, and expansion to other markets becomes relevant only after obtaining a strong foothold there.

*Industry Informant 1* emphasized the importance of market-related measures particularly in the critical stage of TIFIs’ development, but they continue to be important later: “Once you’re up and running your operational performance, then you look to financial performance /.../ hopefully they’d grow in the next 2–3 years”. Market-related measures can

also lay the foundation for future financial success, which was highlighted by *ProMote*.

Few studies on TIFIs have included market-related measures when measuring performance and the justification for these is questionable, even in the post-establishment phase. We discuss market-related measures utilized in much of the BG literature, questioning the inclusion of measures such as ‘rapid market expansion’ (Mort & Weerawardena, 2006) and ‘relative market share’ (McDougall & Oviatt, 1996).

The ‘number of markets entered’ was not considered a key performance measure for all our TIFIs – this measure varied considerably. While the website of *TechApps* (post-establishment phase) revealed a strong focus on entering additional markets, they emphasized that this is not the objective of all TIFIs: “our company has been in existence a little over five years and our product is in over 140 countries. So if you judge success by how quickly you can expand, the company’s been very successful but there’re different ways to monitor success”.

*Industry Informant 5* dismissed the assumption that entering additional markets is always beneficial and desirable for TIFIs: further expansion limits the focus the firm can place in each market, potentially drawing attention away from the most attractive markets: “The number of countries may be a bad thing, to be in more countries than less. What you should have done is concentrated on one or two. So I don’t think you could argue that sort of geographic spread of activity is a fundamental sort of measure” (*Industry Informant 5*).

Altogether, limited resources and lacking capabilities were significant constraints for our interviewees (*NetSupply*, *DesTech*, *TechApps*). With only a few staff members even time differences can place significant physical strain on management in the post-establishment phase. This demands more of the maturing TIFIs in terms of capability-based thinking. We therefore challenge the logic of counting the number of entered markets for assessing TIFIs’ performance even in the post-establishment phase.

A firm’s resources play a significant role in determining its strategies (Barney, 1991). While fast internationalizers undertake a range of innovative strategies to overcome their resource constraints (Freeman, Edwards & Schroder, 2006), the availability of resources was still a primary concern with *NetSupply* (critical phase) introducing the business as a tiny “cash strapped start-up”. As revealed by *Industry Informant 3*, each additional export market represents further costs and complications as the new markets often require significant adaptation of products/processes. This can make entering more markets unattractive for smaller, resource poor TIFIs.

Literature also mentions ‘geographical or psychic distance of entered markets’ as a potential measure (Love, Roper & Zhou, 2016) but our findings indicate that it would be less relevant for TIFIs. Psychic distance is not the motivator of market selection: objectives and entrepreneurial decisions depend on market size and growth potential, demand, and the partners’ distribution networks (*AusCAD*, *HomeFind*, *TechApps*, *InterAct*, *EngineeringTech*, *MinTech*).

Despite its popularity as a performance measure (Jiang et al., 2020), the applicability of ‘market share’ was questioned among our interviewees (*Industry Experts 2 and 5*). TIFIs often develop unique and innovative products (Moen, 2002; Øyna et al., 2018) which can sometimes lead to creating a new market (industry segment) (Odlin, 2019). For example, *TechApps* produced a unique device. In the early phase, the firm had 100% market share until other competitors entered: thus, measuring market share was irrelevant. *Industry Informant 2* suggested: “market share is probably more important to an established firm”. Similarly, *Industry Informant 5* emphasized the focus on gaining a foothold in the market: “You’re going to be a relatively mature business before market share becomes important. We’re talking about getting a foothold”.

Extending the effort of McDougall and Oviatt (1996), we highlight the need to consider the differences between TIFIs and domestic new ventures when selecting performance measures. As TIFIs operate in niche, specialized and complex markets (Moen, 2002), it is difficult to define or measure their market. One of our interviewees (*NetSupply*)

stressed: “no one really knows how large the market is, let alone who’s got a share of it”. Measuring market share relative to the largest competitor, advocated by McDougall and Oviatt (1996), assumes the ability to easily locate competitors. However, our informants (*AusCAD*, *DesTech*, *ProMote*) stated that it is difficult to measure the size of fast moving, global technologically innovative markets: “Market share: it’s too complicated with our market and sometimes I think we don’t have any competitors in China but then it’s what do you consider to be your competitors” (*AusCAD*).

#### 4.4. Other objective measures

While early internationalization might increase the probability of growth (Mudambi & Zahra, 2007), it can reduce survival likelihood due to foreignness and newness. Some TIFIs might choose to exit through acquisition by larger companies (Almor et al., 2014), and only a few firms succeed (Braunerhjelm & Halldin, 2019). Especially for small firms, an acquisition or a takeover can be a signal of the firm’s strength (value) rather than weakness (Richard et al., 2009). Our interviews also confirmed this.

The owner/managers of technology-based firms are entrepreneurial in nature (Trudgen & Freeman, 2014), which allows them to identify and pursue opportunities (McDougall et al., 1994). Referring to TIFIs’ entrepreneurial owners/managers, *Industry Informant 5* highlights that selling the firm and moving onto new endeavors is often the ultimate business success. *NetSupply* (critical phase) aimed to sell the firm and move onto different ventures: “we’ll absolutely sell this business in the next 5 years”. Thus, considering the firm being sold as a failure would be misleading and inaccurate.

Further criticism of measuring firm survival comes from *AusCAD* (post-establishment phase) who argued that survival was a decision made by management rather than an indication of performance. Focusing on the 2008/2009 crisis and its aftermath, it revealed that many TIFIs would have been in situations where they could have filed for bankruptcy, with the differentiating factor being the owner’s optimism and attitude: “It is really a personal choice. You can /.../ push through or you can choose to, I guess, give up and just go bankrupt and go get a day job”.

*TechTraining* described how their rapid, high growth was disrupted due to the COVID-19 pandemic and subsequent dysfunctional global supply chains. This led to an abrupt strategic realignment of their key objective to survival at any cost, and narrowed dramatically their international operations. Thus, survival reflects an entrepreneurial mindset, which is dynamic.

Despite our findings that ‘employee and entrepreneurial team retention’ is essential to developing TIFIs’ competitive advantage, these factors do not feature widely in the literature as performance measures. According to Braunerhjelm and Halldin (2019), in highly specialized markets, technical employees can be a key source of competitive advantage. It takes time to develop this resource base and therefore, employee retention is a key performance measure, particularly for maturing TIFIs (*InterAct*). However, retaining key people may be a challenge for some TIFIs as they cannot offer as high a salary level as larger firms (*NetSupply*), or, in times of downturns and disruptions, pay the salaries at all (*ComDevProjects*).

Employee retention should be used as a performance measure in both the critical development and post-establishment phases. According to *Industry Informant 3*, when operating in specialized markets, it becomes vital to retain highly skilled, technical employees, because “if you can’t hold those people then you’re going to struggle to maintain the strength of your business!”.

In highly specialized markets, technical employees can be a valuable resource and key source of competitive advantage (Barney, 1991). Thus, the ability to retain technical staff can be an important market-related performance measure as it can strongly contribute to future financial success. *InterAct* (post-establishment phase) revealed that an added consequence of high employee turnover is that employees will

inevitably move to the competition. The time and resources it can take to develop staff in TIFIs and the possibility of losing these employees makes employee retention a vital performance measure. According to their website, they “offer a work environment unparalleled in Australia /.../ complete with a studio full of highly talented highly trained professionals” and emphasize the benefits of working for the firm.

One of the key considerations of venture capitalists when assessing investment opportunities is the entrepreneurial team and their experience and networks, as these can predict future success (Han & Celly, 2008). *Industry Informant 2* focused on the importance of the managerial team. Even with a strong innovation-based product/process and financial backing, being able to maintain a strong team can be the difference between failure and success. Therefore, retaining managerial staff and maintaining the ‘team’ becomes an extremely important performance measure: “You can have a pretty mediocre product but a fantastic team and you’d be able to make a good return on your investment. We’ve shown you can have a fantastic product or device or technology and you could have a mediocre team and you’ll fail over and over again” (*Industry Informant 2*).

*NetSupply* (critical phase) highlighted that retaining high quality technical and managerial staff can be a particular challenge for TIFIs due to their inability to remunerate them at the same level as larger firms: “all of us have walked away from salaries that we’re not getting a scrap of now. So you have to make sure that you know you are heading towards the dream, but people are enjoying the process”.

The ability to retain key personnel has also an indirect impact on performance as potential investors assess them as part of a company’s key assets and element of future success (Han & Celly, 2008). Thus, we extend the understanding of the resources and capabilities of the firm (Barney, 1991; Teece et al., 1997) to performance measurement and propose that ‘retention of high quality technical and managerial staff’ and ‘retention of the entrepreneurial team’ are important ongoing performance measures.

#### 4.5. Goal-based subjective measures

Several authors have measured achievement of goals directly, but goal-based measures capture firms’ individuality, and they are highly subjective (Nordman & Melén, 2008), as they are firm-specific. Company goals were also recognized by our interviewees (*NetSupply*, *DesTech*, *HomeFind*, *AusCAD*, *ProMote*). Besides being subjective, goals change over time (*Industry Expert 5*). For example, the COVID-19 pandemic was reflected in the goals of some firms (*OceanTech*, *ArchTech*, *ManufTech*), and in the case of *WebCosmetics* resulted in a major business model innovation reflecting advanced digital-based technology.

TIFIs’ goals and strategies are influenced by the founders’ background (Nordman & Melén, 2008), and the latter also affects performance assessment (*ProMote*, *AusCAD*, *NetSupply*, *DesTech*, *HomeFind*). According to Ingley and Wafa (2016), control of smaller businesses tends to be centralized with ownership often lying with the founders of the firm. Extending this to a performance measurement context, *NetSupply* (critical development phase) emphasized that with only four shareholders, it can freely pursue long-term strategic objectives, even if these sacrifice immediate returns. Moreover, *Industry Informant 5* stated that business situations can be perceived differently by individuals within the firm. Managers’ mindsets are heterogeneous (Freeman & Cavusgil, 2007). Thus, we suggest that goal achievement in any given situation reflects the manager’s mindset (e.g., exploratory or exploitative), rather than performance as “in any business organization there are conservatives and people that want to push on.” (*Industry Informant 5*).

Nordman and Melén (2008) highlighted that firms differed in strategy depending upon whether their founders had a commercial or technical background. This was found to play a significant role in determining the performance objectives of *ProMote*, *AusCAD* (post-establishment phase), *NetSupply* and *HomeFind* (critical development phase). This is summarized by *Industry Informant 3*: “If the

owner/managers are technical people or engineers or something like that, they are going to be looking at technical issues and they will want to be achieve the best technical products /.../. If the owner/managers are sales marketing people, they might be flat out marketing it and building customer relationships /.../, but actually the product might not be that brilliant”.

TIFIs are heavily influenced by their owners/managers, and the objectives are firm-specific. Highlighting this, the goals of *NetSupply*, *HomeFind* (critical development phase), *AusCAD* and *ProMote* (post-establishment phase) were unique and determined by their owners. For example, the owner’s impact on *AusCAD*’s strategy is evident through a review of their website, stressing that the latter “is passionate about design, and has developed a trusted methodology to engage both business and product development”. Similarly, *ProMote* emphasized its focus on high-quality products: “The managing director is very focused on everything being high quality and that has been passed down throughout the organization”.

Fully subjective measures can lack reliability due to the changing goals they are compared against (Richard et al., 2009). *Industry Informant 5* highlighted that firms’ goals are unique which makes generalizable measures difficult to develop. Utilizing ‘achievement of goals’ as a measure is complex because goals are often readjusted and ‘toned down’ after failure to make outcomes appear more positive. The key is to measure performance relative to the firm’s initial goals, not those later adjusted to reflect success because “There’s nothing fixed in these things. It has some limitations because goals change” (*Industry Informant 5*).

Richard et al. (2009: 736) suggest that goal-based measures are “unreliable in the face of the highly variable aspirations of respondents” while according to Bruneel et al. (2022: 818), younger firms’ “longer-term goals are less well defined, more vague”. We support including achievement of goals as a way of encompassing the broad range of TIFIs’ objectives. However, we highlight some potential flaws that could reduce the reliability of the measure, as goals can change.

We summarize our analysis by suggesting a comprehensive framework of TIFIs’ performance measures in the critical development phase and beyond in the post-establishment phase. TIFIs are complex and adaptive systems where evolution can be seen as a navigation through dynamic states or phases (Freeman & Cavusgil, 2007). Acknowledgment of the complex approaches that our interviewees provide offers a more persuasive model that considers the dynamics of the exploratory critical development phase where innovation must occur to set the foundations for future growth in the post-establishment exploitation phase (Ingley & Wafa, 2016). Our findings explain how innovations create competitive advantage. Many TIFIs have no close competitors, but as innovations are required to support their survival, they will follow a dynamic process of innovation through exploration and exploitation in new product/processes as they evolve into more complex organizations. TIFIs manage both exploration and exploitation approaches with the implication of overlapping and more complex use of performance measures in their post-establishment phase. Thus, utilizing ‘achievement of goals’ as a performance measure is complicated because goals are often readjusted and re-interpreted after major exogenous events or firm failure to make outcomes appear more positive (Nudurupati et al., 2021).

## 5. Discussion

Drawing from our findings, we develop a set of theoretical insights that we support with propositions. TIFIs have distinct characteristics and objectives, and thus their export performance measurement should reflect them. Younger TIFIs prefer using subjective measures when assessing their export performance but later, as they transform into more complex organizations, they may start using more objective, profit-based measures. However, this change is not absolute: maturing TIFIs focus on innovation and therefore they become locked into continuous cycles of new product development (NPD) that result in the perpetual phases of exploration followed by exploitation, with implications for the ongoing relevance of subjective measures. This also results in constant

disruption to the organization that has to move from exploration to exploitation in new cycles as they evolve, and often overlap, suggesting the ongoing importance of subjective measures. Thus, some mature TIFIs continue using subjective measures when assessing their export performance, as innovation – and thus NPD phases – is the source of their uniqueness and continuous focus of their operations.

TIFIs' new product development process consists of stages which act as 'guideposts' against which these firms' performance is evaluated (Tzokas, Hultink & Hart, 2004). Prior research indicates a need to adapt the evaluation criteria in line with the development of the firm (Martinsuo & Poskela, 2011). Thus, we propose:

**P1.** : While young TIFIs focus on exploring and developing new products, maturing TIFIs concentrate on exploiting existing technology, and further NPD phases. Due to this, they evaluate their export performance differently.

**P2.** : Over time, TIFIs are inclined to move from using subjective measures to objective, profit-based measures depending on the phase of NPD.

We designed this study to understand how TIFIs' performance measures change as the companies mature. TIFIs have seasoned managers/entrepreneurs with rich business experience who operate in sectors characterized by constant change and disruption. They are creative and explore, develop and exploit novel opportunities to sustain their competitive advantage, and also expect and intend to disrupt and destroy existing processes through NPD and digital-based innovation. Their uncertainty tolerance is high and ability to take risks is notable. Consequently, instead of avoiding 'creative destruction' (Schumpeter, 1942), they are the disruptors themselves (Spencer & Kirchoff, 2006). Further, in such fast-moving industries, TIFIs will emerge and drive change through creative destruction of existing technologies and processes, and thus will have major implications about how we assess their performance.

Besides internal factors, one additional explanation for the identified dynamics in export performance measurement may be the volatile, uncertain, complex and ambiguous (VUCA) environment in which TIFIs must continue to operate. In this environment, new industry segments are continuously created but TIFIs are also responsible for the 'creative destruction' of others as the sectors become redundant. This may explain why the implications of COVID-19 to these firms' export performance were modest. TIFIs grow and evolve and simultaneously interpret and respond continuously to environmental dynamics; thus, over time also becoming more resilient than their competitors (Linnenluecke, 2017). In building this resilience, they need a portfolio of resources and capabilities – networks, alliances, unique technology, international managerial orientation, technological (Øyna et al., 2018; Rodríguez & Rodríguez García, 2005) and other dynamic capabilities – to survive and mature (Braunerhjelm & Halldin, 2019; Teece et al., 1997). Therefore, using growth-based indicators which focus on the focal firm alone, gives only a partial view of their export performance.

Motivated by the need to develop appropriate performance measures for TIFIs and the impact of this legacy as an "evolving firm" (Cavusgil & Knight, 2015: 12) operating in such industries, we found that due to focusing on niche strategies and involvement in constant innovation-driven NPD throughout their industry evolution, TIFIs' objectives and performance measures are interlinked. This is not a 'static' process: rather, it 'locks' maturing TIFIs into an ongoing cycle of entrepreneurial orientation, innovation and experimentation: namely, 'creative destruction'. Thus, we developed the next propositions:

**P3.** : As the cycles of NPD phases are likely to overlap, a new NPD phase will 'lock' TIFIs into further capital investment and affect profit-based measures.

**P4.** : In each NPD phase, environmental dynamics and firms' resources and capabilities affect TIFIs' performance and also their choice of

performance measures.

Additionally, we contrasted younger and maturing TIFIs and demonstrated overlapping and distinct performance measures displayed in Fig. 4. Innovation, creating strategic advantages (e.g., via creative and disruptive technological development) and attraction and retention of competent staff are key components driving young TIFIs' competitive advantage. Internationalization and NPD remain fundamental to their rapid expansion. They might also strive to survive until they can sell the firm. Thus, when measuring survival, it is important to account for the range of ways that firms can exit the market, why they choose to do so, and what are the outcomes for the founder/owner.

For maturing TIFIs, the focus remains on growing the business, building contacts, and exploring and developing new high-quality products, exploiting existing products in current international markets, and simultaneously exploring new markets. The critical development phase of NDP remains the fundamental characteristic of maturing TIFIs and continues as an interlocking cycle of short technology-edged opportunities for development and exploitation in their post-establishment phase. Because of this, even maturing TIFIs may not yet achieve growth and profits. Limited financial and human resources of the critical development phase continue making 'employee attraction and retention' vital to TIFIs with the added risk of losing high quality staff to competitors if their salaries and working environment are not competitive enough. In the post-establishment phase, managers' goals often change. Moreover, some founders/owners may still aim to sell the firm, as part of developing their personal international profile in new sectors as they drive the process of 'creative destruction' of existing competitor offerings. However, entrepreneurs do not set their goals in a vacuum as their objectives are dependent on other actors in their network. For example, the involvement of a venture capitalist could affect both the objectives and the chosen measures. Thus, achievement of goals and survival are also problematic performance measures in this phase. Consequently, we propose:

**P5.** : The entrepreneur's long-term personal and professional aims affect the selection of performance measures.

**P6.** : Employee attraction and retention is vital for both young and mature TIFIs.

## 6. Conclusions and implications

Prior research on fast internationalizing firms provides us very little information on how they evolve and adapt over time and how this development influences their performance (Freixanet & Federo, 2022). This study focused on TIFIs and added to our understanding on how their export performance measures developed over time.

To be specific, we challenge the widely held assumption that exporters have homogeneous objectives and that they would use similar indicators for evaluating their performance (Sadeghi, Rose et al., 2021). Instead of assuming that export performance measures are context free and can be applied across contexts, we took one context – TIFIs – and demonstrated that context is important. Additionally, longitudinal studies on export performance are rare (Madsen & Moen, 2018) but there is an underlying assumption that firms move from the use of subjective measures to the use of objective measures when they mature. Our study indicates that – again, in the context of TIFIs – the age of the firm is not decisive but the nature of the business matters. We also provide a more fine-grained view on the export performance measures than the traditional objective/subjective dichotomy (cf. Zucchella et al., 2019). Furthermore, our study downplays the impact of external critical events on export performance (of the negative impact of COVID-19, see, for example, Al Amosh & Khatib, 2023 and Jordaan, 2023), as for TIFIs these events seem to be of less importance due to their early adoption of technology, often an enabler to new, innovative products and processes.

Our contextualized explanation took the technological turbulence of

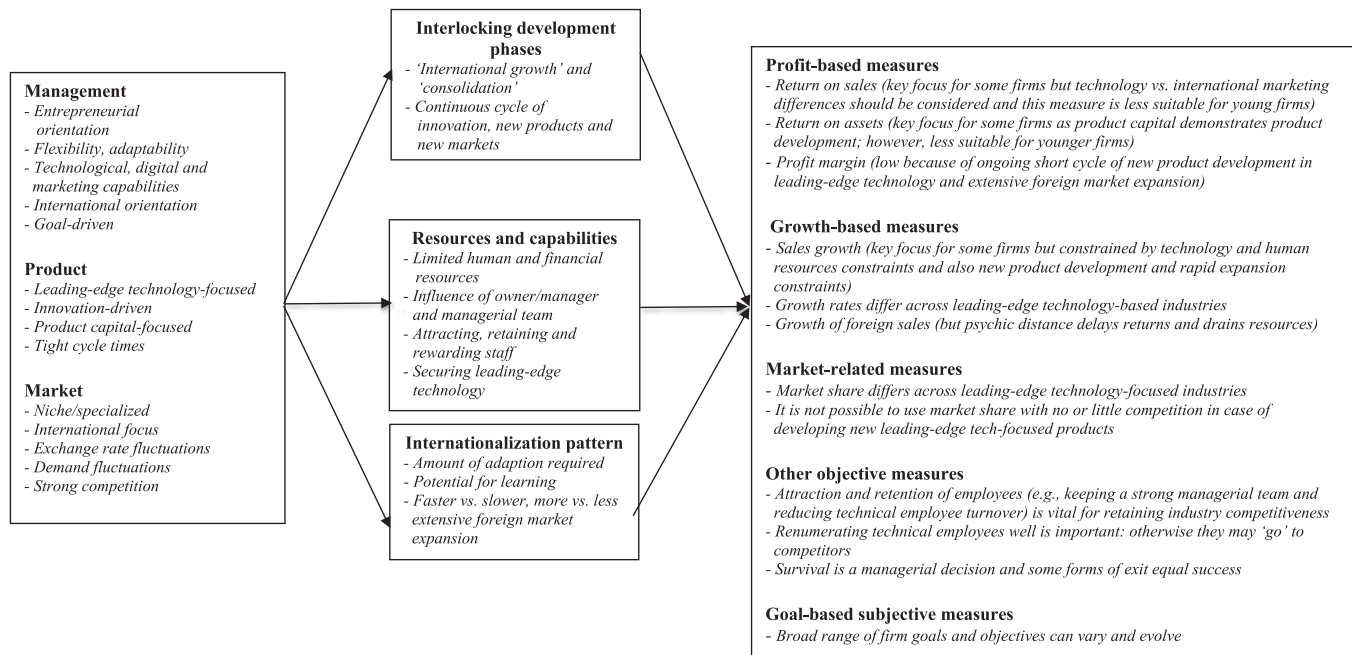


Fig. 4. Impact of firm characteristics on technology-focused maturing TIFIs' performance measures.

the industry into account, as it has been found to act as a link between entrepreneurial alertness and performance (Crespo, Simões & Fontes, 2022). We also contributed to the literature by making the following conclusions.

1. Technology-focused firms which internationalize fast change their performance measurement as they evolve but the changes are not radical, instead objective measures are added to their existing subjective measures. The fundamental reason for this is their focus on creation of new innovations as existing technology is continuously challenged by disruptive events which require adaptation.
2. Technology-based sectors are fast-moving and rapidly evolving, which requires constant re-focus on the generation of new products and services. As the firm evolves, due to multiple parallel innovation processes, the managers will experience simultaneous cycles of exploration and exploitation strategies, the latter requiring more objective measures, while the former relying on subjective measures.
3. What clearly distinguishes TIFIs from other exporters is their ability to create new sectors and even industries. They never fully mature ('settle down') due to constant new product development and new market entries.

We suggest managers to balance opportunity and risk, without losing entrepreneurial prowess, and focus on continuous securing of resources (especially leading-edge technology), attracting and retaining technology-savvy and competent staff, and maintaining a strong managerial team that promotes a culture of innovation and learning-by-doing. Continuous maintaining and renewing international networks is also important. There is no 'one size fits all' solution for performance measurement as firms differ and their goals change during their development. It is important to acknowledge that if the goals keep changing, then the measures should not stay constant, either. Besides being subjective, goals will change over time: for example, the COVID-19 pandemic was pronounced in the changing goals of some firms, and in particular, caused new significant business model innovation reflecting advanced digital-based technology. Thus, performance measurement should remain flexible (if necessary, change during a firm's development) and the selection of measures should depend on which of them will help a particular firm to achieve its goals in its near or more distant

future.

Future business environments will continue to be volatile, uncertain, complex and ambiguous (VUCA). Interestingly, our findings show that COVID-19 did not have a significant effect on the export performance of TIFIs. Maturing TIFIs are internet-based, used to managing disruptions to their industry, with a focus on ongoing cycles of exploring and developing NPD phases followed by exploitation to sustain their competitive advantage through continuous innovation. Thus, when developing and selecting export performance measures one key criterion should be resilience to external shocks. This would help the firms that operate in such industries in the continuity management of their companies.

We encourage future researchers to investigate TIFIs from other countries and industries, as this could enable them to capture more diversity in terms of selecting suitable performance measures: business environments differ and thus, TIFIs' managers might prefer different performance measures due to different goals. Additionally, longitudinal case studies could be useful for explaining why some TIFIs used particular measures during their critical and post-establishment phase, and if and why their attitudes toward these measures changed during their development. Such studies could confirm if, for instance, TIFIs' decision to start using a different set of measures after the critical development phase resulted from internal factors (e.g., strategic change) or external ones (e.g., an economic crisis) or if they changed their attitude toward some measures during the post-establishment phase. Surveys could be also useful for identifying most preferred measures for different TIFIs, and for studying if the performance of firms using a certain set of measures differed from those preferring others. More attention should be also paid to developing appropriate performance measures for different firm types: for instance, smaller and larger, more and less technology-focused TIFIs. Finally, the impacts of VUCA events on performance measurement need detailed attention. For instance, different industries were not affected similarly by COVID-19, and some firms received generous governmental support, while others faced long 'lockdown' periods in their location. This might affect firms' attitudes toward using certain performance measures, as in some industries, achieving goals became impossible, while in some others, this was not so.

Data Availability

The data that has been used is confidential.

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Appendix 1. Additional quotes for thematic development of maturing TIFs' performance measures

Theme	Illustrative quotes
Profit-based measures	<p>"I think if they're early stages, I wouldn't be looking at those measures. Return on sales and assets and equity, it takes a year or two to even start to get that sort of return I'd say" (Industry Expert 1).</p> <p>"For our financial performance to increase and to grow, we need to have better operational performance" (Promote).</p> <p>"It's difficult because for us it can take...up to three to five years to produce a video game and in that time, we're receiving no income" (WebDev).</p> <p>"overall there's been a 30%, close to 30% reduction in revenue [since the COVID-19 pandemic]..." (AISoftware).</p> <p>"We can measure any business impact we're having there [overseas markets]. The problem...is that often...[the investments] don't result in immediate results" (WebDev).</p> <p>"Once we release it we pretty much start seeing sales immediately, because we sell through digital platforms..... they all have different payment terms, so sometimes it can take a quarter or three or four months before we start seeing some of the sale royalties" (WebDev)</p> <p>"Our revenue doubled last year during COVID-19. We found that most of our customers were in lockdown and had time..." (EquistTech)</p> <p>"The one for us which sticks out in the financial performance is definitely ROI... Absolutely everything, that is kind of one of our main focus points" (Promote).</p>
Growth-based measures	<p>"It does take time yes, with anything in the oil and gas business, it takes a long time to get off the ground and there's that at risk money front, but the rewards are much better two or three years later" (Gas-Oil Solutions).</p> <p>"We [quickly] doubled our second-year revenue ... and we're [rapidly] growing at about 20–30% every year and we ship our games all over the world" (WebDev).</p> <p>"We've actually experienced over 30% growth!" (SanitTech).</p> <p>"What's been happening for us is recently when obviously COVID started.../.../ what our sales did is take a dip in those months in those markets. Then what our sales did is bounce back!!!...because we're a very nimble online business we re-crafted all our messaging..." (HealthSportsTech).</p> <p>"Essentially because we wanted to, you know, one of our major costs is our investment in R&amp;D and we wanted to be able to leverage that investment by generating [international] sales in complimentary [foreign] markets" (ElectroTech).</p> <p>"You know the hell that you're entering into [rapid expansion overseas] but anyway the thing is [new export manager] he's grown it to about \$1.5 million on Amazon and it's about \$1.3 million here...[COVID] it's the best thing that ever happened to us...Business has been the best it's ever been over the past six months" (HealthNetTech).</p>
Market-based measures	<p>"The bulk of that business for us is into South East Asia, India, etc. So we don't do any business of any worth into the Americas or Europe. Strategically very simple reason for that. We have behemoth competitors in those markets. And we are smaller, nimbler and we've got good relationships such that we can out maneuver them in our territories basically." (LightTech).</p> <p>"...the intent is for him to become aggressive over the next 12 months and get out to find new markets" (IndustAccess).</p> <p>"If you've got a software product which needs to be customized and it might need continual localization and things like that, then that's obviously going to be a cost to you in terms of maintaining that export market. Someone's got to be over there doing it" (Industry Expert 3).</p> <p>"When we launched our product, we had no competitors and to this date, we only have one genuine competitor" (TechApps).</p> <p>"At the moment [biggest market] it's the US. What we've done is we have [technologically superior]...biofuels. /.../ We've got a very big part of that market share now. We don't do it ourselves. We partner with large corporations. A company called [xxx] is our partner. They're the ones who produce market, sell and do all that... But that's going worldwide [and] we have more technology that will take [us] into South America, etc. That's how we've got several products out there now. We have a very big and growing part of the world's biofuels" (Microtech).</p> <p>"[We can enter] every country that has an internet connection. So I think we've even done sales in Antarctica. So it really comes down to if they have a viable government connection and their governments don't restrict communications to Western networks" (WebDev).</p> <p>"The world becoming that way [Pandemic leading to border closures and home] is what enabled our industry to take off... It's just the digital online distribution of [xxx], that segment has grown and is now greater than the physical side you know where you go into a store... So the digital side now is actually...it's just bigger and growing" (EngineeringTech).</p> <p>"That would be the United States, the US. Though the EU as a group probably produces more but with France and Germany being the strongest companies there, but the United States as a single country produces more than the EU and then Russia and China are also very big markets for us and so is Taiwan and Japan" (WebDev).</p> <p>"If you need to get a deal tomorrow forget it, it's just not going to happen. So it depends on what the people's strategy is really, and China's not the only difficult market. I mean India can be a very difficult market to sell into. Even Japan again, very good once you have made the deal, but it can take you 3 years to 5 years to make the deal" (Industry Expert 3).</p> <p>"We [are able to] go [anywhere with our leading tech product, such as] to Mauritius, Bahrain, New Zealand, New Caledonia, Philippines, South Korea, Qatar, Hong Kong, Indonesia, Macau, Oman, Malaysia, Thailand, Japan, we're in the UAE but we're in the process of pulling out of there only because of the person that we're dealing with, no other reason. [But] we've had a long-standing relationship with them but we've decided to cut ties cause it's just too difficult. [However, we do have a new relationship] in Iran, [and now] we do have a new customer that [cautiously] we've only just sent one shipment to in Kuwait" (Techfoods).</p> <p>"You know we've...being shut because of COVID!!! Nothing is air freighted into Beijing since the 13<sup>th</sup> of June 2020...So most of our market share is [now] going into the Shanghai or Guangzhou...So we've still got a solid relationship there but we've probably moved from 80% of our volume down to 40% of our volume in China and we're concentrating more heavily on Taiwan" (SalTech).</p>
Other objective measures	<p>"You look at entrepreneurs, and that's what they do. Sometimes they fail and they rise again, and sometimes they fail and don't rise again, and if they succeed they get bored. So, moving onto some new initiative would be a measure of success for them" (Industry Expert 5).</p> <p>"What's different now [since COVID] that I'm not happy with is we are not engaging with enough people outside of our clients to build pipeline for the next two years...Now it's urgent. Everything's urgent and you've got to decide urgently... And you know I had to fire someone in the middle of COVID... Like I just said if I don't make this person redundant now, I'm going to end up [stuck and] she will not work for at least six months" (ComDevProjects).</p> <p>"There's a lot more that we can do with our [product] and it's just as we mature and bring in expertise and etc. etc." (TechCuts).</p> <p>"It's really hard to measure [the impact from visiting overseas customers]. Typically, I can see that within a couple of months, probably three or four months of a visit, /.../ an order will come through and that happens fairly consistently. But often it's a long time lag from when I do a visit to when we do the quote to getting the actual order. Sometimes six, eight months, so it's a little bit hard to measure" (Monitor Dev).</p> <p>"Well, a few years [ago] we took the strategy that we really needed to place more of our senior people in all the countries in Asia. Traditionally we were seen as a fly in, fly out expert. We were the international expert coming in and it's still important for us to be seen like that... In China...they want to know that they're getting their national best. They don't want us doing it in a design workshop down the road. That kind of thing. They want to know if we fly in/fly out but at the</p>

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Theme	Illustrative quotes
Goal-based subjective measures	same time we really realized we had to get much more senior people in countries throughout the region and my gosh we were fortunate we did that because in COVID that's what's been so important because I haven't been able to fly. Normally, we have a disproportionate amount of our senior leadership on airplanes at any time" (ArchTech).
	"We're really built on staff. It takes a long time to train somebody up to be productive in this industry and when they leave it's just a massive blow. it's worse that they would just leave, but our industry is small enough that they'd be here somewhere else in Melbourne, and they would be one of our competitors" (GamePlay).
	"We launched our primary product worldwide in XXXX [3 years from inception] and since then we've been employing. I think we have nearly 19 staff now [year 7]. We've just made an offer to another. So [our focus] we've been growing the business" (WebDev).
	"So [MD] is actually now on boards of consultants and governors and things like that, various organizations, so he's maintaining the profile and that's always harder to do on a return on investment. But, there will be, for example, some new work coming up in the Middle East and so we'll be able to directly relate his travel to signing an agreement to achieve a particular financial outcome" (TechEd).
	"For me to enable this company to grow to where it can be I can't see me doing it with my current shareholders and I'm really questioning for me that I can take it to where it could go." (EngLogistics).
	"I wanted /.../ low overheads and low staff and a product that gave you a good market, that was my aim... The last hurrah was doing something that I could control and didn't have to rely on other people... employing people and giving people jobs, I've done that, I've been there, I did that for 30 years and this time [learning from previous economic crisis] I didn't wanna do it" (SeafoodProcess).
	"So, it can be competitive somewhat but I think we definitely have created a bit of a niche for ourselves, there's always going to be a need for our business anyway" (TechMin).
	"I guess since that time we've been largely paying off debt, rebuilding asset because the company and it's really before COVID hit we were I would say very much on track with that. So a positive cash balance, Really the only debt we had [until COVID] was some equipment finance which is productive assets in the company and that is you know well and truly at a conservative level in terms of gearing and finance so not a problem at all. And I guess this financial year for us was about two things; it was about getting our sales force tuned up and back onto a growth strategy and secondly dealing with some things in the past in terms of inventory..." (ArchTech).
	"We were actually expanding [further internationally] ... This year was gonna be a year when we made a profit and it was all gonna be rosy but once COVID hit because we're a high value, low volume product that is generally sold in to South East Asia for food service all the restaurants shut... So, we had to practically rethink what we were going to do..." (OceanTech).

## References

- Al Amosh, H., & Khatib, S. F. A. (2023). COVID-19 impact, financial and ESG performance: Evidence from G20 countries. *Business Strategy and Development, in Press*. <https://doi.org/10.1002/bsd2.240>
- Almor, T. (2011). Dancing as fast as they can: Israeli high-tech firms and the great recession of 2008. *Thunderbird International Business Review, 53*(2), 195–208.
- Almor, T. (2013). Conceptualizing paths of growth for technology-based born-global firms originating in a small-population advanced economy. *International Studies of Management and Organization, 43*(2), 56–78.
- Almor, T., Tarba, S. Y., & Margalit, A. (2014). Maturing, technology-based, born-global companies: Surviving through mergers and acquisitions. *Management International Review, 54*(4), 421–444.
- Axinn, C. N. (1988). Export performance: Do managerial perceptions make a difference? *International Marketing Review, 5*(2), 61–71.
- Barkema, H. G., & Drogendijk, R. (2007). Internationalising in small, incremental or larger steps? *Journal of International Business Studies, 38*(7), 1132–1148.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120.
- Braunerhjelm, P., & Halldin, T. (2019). Born globals – presence, performance and prospects. *International Business Review, 28*(1), 60–73.
- Bruneel, J., Gaeremynck, A., & Weemaes, S. (2022). Outside board members and strategic orientation of new ventures in the startup phase. *Strategic Entrepreneurship Journal, 16*(4), 801–825.
- Cavusgil, S. T., & Knight, G. (2015). The born global firm: An entrepreneurial and capabilities perspective on early and rapid internationalization. *Journal of International Business Studies, 46*(1), 3–16.
- Cerrato, D., & Fernhaber, S. A. (2018). Depth versus breadth: Exploring variation and performance differences among internationalising new ventures. *International Small Business Journal, 36*(7), 758–779.
- Chen, J., Sousa, C. M. P., & He, X. (2019). Export market re-entry: Time-out period and price/quality dynamics. *Journal of World Business, 54*(2), 154–168.
- Chetty, S., & Campbell-Hunt, C. (2003). Explosive international growth and problems of success amongst small to medium-sized firms. *International Small Business Journal, 21*(1), 5–28.
- Choquette, E., Rask, M., Sala, D., & Schröder, P. (2017). Born globals—is there fire behind the smoke? *International Business Review, 26*(3), 448–460.
- Contractor, F. J., Hsu, C., & Kundu, S. (2005). Explaining export performance: A comparative study of international new ventures in Indian and Taiwanese software industry. *Management International Review, 45*(3), 83–110.
- Crespo, N. F., Simões, V. C., & Fontes, M. (2020). Competitive strategies and international new ventures' performance: Exploring the moderating effects of internationalization duration and preparation. *Business Research Quarterly, 23*(2), 120–140.
- Crespo, N. F., Simões, V. C., & Fontes, M. (2022). Uncovering the factors behind new ventures' international performance: Capabilities, alertness and technological turbulence. *European Management Journal, 40*(3), 344–359.
- Crick, D., & Crick, J. (2014). The internationalization strategies of rapidly internationalizing high-tech UK SMEs. Planned and unplanned activities. *European Business Review, 26*(5), 421–448.
- Dahoioe, J. H., Meidute-Kavaliauskiene, I., Vanaki, A. S., Podvieszko, A., & Beheshti Jazan Abadi, E. (2020). Development of a firm export performance measurement model using a hybrid multi-attribute decision-making method. *Management Decision, 58*(11), 2349–2385.
- Donbesuur, F., Zahoor, N., & Boso, N. (2022). International network formation, home market institutional support and post-entry performance of international new ventures. *International Business Review, 31*(3). Article 101968.
- Dong, G., Kokko, A., & Zhou, H. (2022). Innovation and export performance of emerging market enterprises: The roles of state and foreign ownership in China. *International Business Review, 31*(6). Article 102025.
- Edmondson, A. C., & McManus, S. E. (2007). Methodological fit in management field research. *Academy of Management Review, 32*(4), 1155–1179.
- Efrat, K., & Shoham, A. (2012). Born global firms: the differences between their short- and long-term performance drivers. *Journal of World Business, 47*(4), 675–685.
- Evers, N., Gliga, G., & Rialp-Criado, A. (2019). Strategic orientation pathways in international new ventures and born global firms—Towards a research agenda. *Journal of International Entrepreneurship, 17*(3), 287–304.
- Falahat, M., Knight, G., & Alon, I. (2018). Orientations and capabilities of born global firms from emerging markets. *International Marketing Review, 35*(6), 936–957.
- Falahat, M., & Miglin, M. W. (2017). Export performance of international new ventures in emerging market. *International Journal of Business and Globalisation, 19*(1), 111–125.
- Fariborzi, H., Osiyevskyy, O., & DaSilva, C. (2022). The effect of geographic scope on growth and growth variability of SMEs. *Journal of World Business, 57*(5). Article 101371.
- Freeman, S., & Cavusgil, S. T. (2007). Toward a typology of commitment states among managers of born-global firms: A study of accelerated internationalization. *Journal of International Marketing, 15*(4), 1–40.
- Freeman, S., Deligonul, Z., & Cavusgil, T. S. (2013). Strategic re-structuring by born-globals using outward and inward-oriented activity. *International Marketing Review, 30*(Special Issue 2), 156–182.
- Freeman, S., Edwards, R., & Schroder, B. (2006). How smaller born-global firms use networks and alliances to overcome constraints to rapid internationalization. *Journal of International Marketing, 14*(3), 33–63.
- Freixanet, J., & Federo, R. (2022). When born globals grow up: A review and agenda for research on the performance of maturing early internationalizers. *Management International Review, 62*(6), 817–857.
- Ganotakis, P., Konara, P., Kafourous, M., & Love, J. H. (2022). Taking a time-out from exporting: Implications for the likelihood of export re-entry and re-entry export performance. *Journal of World Business, 57*(5). Article 101349.
- Gerschewski, S., Rose, E. L., & Lindsay, V. J. (2015). Understanding the drivers of international performance for born global firms: An integrated perspective. *Journal of World Business, 50*(3), 558–575.
- Gerschewski, S., Scott-Kennel, J., & Rose, E. L. (2020). Ready to export? The role of export readiness for superior export performance of small and medium-sized enterprises. *World Economy, 43*(5), 1253–1276.
- Gerschewski, S., & Xiao, S. S. (2015). Beyond financial indicators: An assessment of the measurement of performance for international new ventures. *International Business Review, 24*(4), 615–629.

- Graebner, M. E., & Eisenhardt, K. M. (2004). The seller's side of the story: Acquisition as courtship and governance as syndicate in entrepreneurial firms. *Administrative Science Quarterly*, 49(3), 366–403.
- Han, M., & Celly, N. (2008). Strategic ambidexterity and performance in international new ventures. *Canadian Journal of Administrative Sciences*, 25(4), 335–349.
- Huang, S., Zhu, Y., Zhang, K., & Ding, Z. (2021). The determinants of international new venture performance: A review and future research agenda. *International Marketing Review*, 38(5), 1006–1046.
- Hughes, M., Cesinger, B., Cheng, C.-F., Schuessler, F., & Kraus, S. (2019). A configurational analysis of network and knowledge variables explaining born globals' and late internationalizing SMEs' international performance. *Industrial Marketing Management*, 80, 172–187.
- Hult, G. T. M., Ketchen, D. J., Griffith, D. A., Chabowski, B. R., Hamman, M. K., & Dykes, B. J. (2008). An assessment of the measurement of performance in international business research. *Journal of International Business Studies*, 39(6), 1064–1080.
- Ibeh, K., Jones, M. V., & Kuivalainen, O. (2018). Consolidating and advancing knowledge on the post-entry performance of international new ventures. *International Small Business Journal: Researching Entrepreneurship*, 36(7), 741–757.
- Ingle, C., & Wafa, K. (2016). SME growth trajectories, transitions and board role portfolios: A critical review and integrative model. *International Small Business Journal*, 34(1), 1–22.
- Jeong, J., & Yang, J.-S. (2023). Why do some firms stop exporting? *International Business Review*, 32(4), Article 102141.
- Jiang, G., Kotabe, M., Zhang, F., Hao, A. W., Paul, J., & Wang, C. L. (2020). The determinants and performance of early internationalizing firms: A literature review and research agenda. *International Business Review*, 29(4), Article 101662.
- Jordaan, J. A. (2023). Firm-level characteristics and the impact of COVID-19: Examining the effects of foreign ownership and international trade. *The World Economy*, in Press. <https://doi.org/10.1111/twec.13392>
- Kalinic, I., & Brouters, K. D. (2022). Entrepreneurial orientation, export channel selection, and export performance of SMEs. *International Business Review*, 31(1), Article 101901.
- Kirpalani, V.H.M., & Ghauri, P.N. (2015). Overview. In {C}{C}{C}P.N. Ghauri{C}, & {C} V.H.M. Kirpalani{C} (Eds.){C}{C}, *Handbook of research on international entrepreneurship strategy: Improving SME performance globally* (pp. 3–20). Edward Elgar.
- Knight, G., & Cavusgil, S. T. (2004). Innovation, organizational capabilities, and the born-global firm. *Journal of International Business Studies*, 35(2), 124–141.
- Knight, G. A., & Liesch, P. W. (2012). Internationalization: From incremental to born global. *Journal of World Business*, 51(1), 93–102.
- Komlos, J. (2016). Has creative destruction become more destructive? *B E Journal of Economic Analysis and Policy*, 16(4), Article 20160179.
- Kriz, A., & Welch, C. (2018). Innovation and internationalisation processes of firms with new-to-the-world technologies. *Journal of International Business Studies*, 49(4), 496–522.
- Leonidou, L. C., Katsikeas, C. S., & Coudounaris, D. N. (2010). Five decades of business research into exporting: A bibliographic analysis. *Journal of International Management*, 16(1), 78–91.
- Linnenluecke, M. K. (2017). Resilience in business and management research: A review of influential publications and a research agenda. *International Journal of Management Reviews*, 19(1), 4–30.
- Love, J. H., Roper, S., & Zhou, Y. (2016). Experience, age and exporting performance in UK SMEs. *International Business Review*, 25(4), 806–819.
- Lu, J. W., & Beamish, P. W. (2004). International diversification and firm performance: The S-curve hypothesis. *Academy of Management Journal*, 47(4), 598–609.
- Madsen, T. K., & Moen, Ø. (2018). Managerial assessments of export performance: What do they reflect? *International Business Review*, 27(2), 380–388.
- Magnani, G., & Gioia, D. (2023). Using the Gioia Methodology in international business and entrepreneurship research. *International Business Review*, 32(2), Article 102097.
- Martin, S. L., Javalgi, R. R. G., & Ciravegna, L. (2020). Marketing capabilities and international new venture performance: The mediation role of marketing communication and the moderation effect of technological turbulence. *Journal of Business Research*, 107, 25–37.
- Martinsuo, M., & Poskela, J. (2011). Use of evaluation criteria and innovation performance in the front end of innovation. *Journal of Product Innovation Management*, 28(6), 896–914.
- McDougall, P., & Oviatt, B. (1996). New venture internationalization, strategic change, and performance: A follow-up study. *Journal of Business Venturing*, 39(11), 23–40.
- McDougall, P., Shane, S., & Oviatt, B. (1994). Explaining the formation of international new ventures: The limits of theories from international business research. *Journal of Business Venturing*, 37(6), 469–487.
- Melén Hånell, S., & Nordman, E. R. (2019). What geographical scope works best for rapidly internationalizing SMEs? *Journal of Business & Industrial Marketing*, 34(6), 1194–1202.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage Publications.
- Moen, Ø. (2002). The born globals: A new generation of small European exporters. *International Marketing Review*, 19(2/3), 156–175.
- Moen, Ø., Falahat, M., & Lee, Y.-Y. (2022). Are born global firms really a “new breed” of exporters? Empirical evidence from an emerging market. *Journal of International Entrepreneurship*, 20(1), 157–193.
- Morgan, H. M., Sui, S., & Baum, M. (2018). Are SMEs with immigrant owners exceptional exporters? *Journal of Business Venturing*, 33(3), 241–260.
- Mort, G. S., & Weerawardena, J. (2006). Networking capability and international entrepreneurship. *International Marketing Review*, 23(5), 549–572.
- Mudambi, R., & Zahra, S. A. (2007). The survival of international new ventures. *Journal of International Business Studies*, 38(2), 333–352.
- Nemkova, E. (2017). The impact of agility on the market performance of born-global firms: an exploratory study of the ‘Tech City’ innovation cluster. *Journal of Business Research*, 80, 257–265.
- Nordman, E. R., & Melén, S. (2008). The impact of different kinds of knowledge for the internationalization process of born globals in the biotech business. *Journal of World Business*, 43(2), 171–185.
- Nudurupati, S. S., Garengo, P., & Bititci, U. S. (2021). Impact of the changing business environment on performance measurement and management practices. *International Journal of Production Economics*, 232, Article 107942.
- Nummela, N., Saarenketo, S., & Loane, S. (2016). The dynamics of failure in international new ventures: A case study of Finnish and Irish software companies. *International Small Business Journal*, 34(1), 51–69.
- Nummela, N., Vissak, T., & Francioni, B. (2022). The interplay of entrepreneurial and non-entrepreneurial internationalization: an illustrative case of an Italian SME. *International Entrepreneurship and Management Journal*, 18(1), 295–325.
- Odlin, D. (2019). Domestic competitor influence on internationalizing SMEs as an industry evolves. *Journal of World Business*, 54(2), 119–136.
- Odlin, D., & Benson-Rea, M. (2017). Competing on the edge: Implications of network position for internationalizing small- and medium-sized enterprises. *International Business Review*, 26(4), 736–748.
- Ong, X., Freeman, S., Goxe, F., Guercini, S., & Cooper, B. (2022). Outsidership, network positions and cooperation among internationalizing SMEs: An industry evolutionary perspective. *International Business Review*, 31(3), Article 101970.
- Øyna, S., Almor, T., Elango, B., & Tarba, S. Y. (2018). Maturing born globals and their acquisitive behavior. *International Business Review*, 27(3), 714–725.
- Pangarkar, N., & Yuan, L. (2022). Industry life cycle, geographic diversification and performance of international new ventures. *Multinational Business Review*, 30(1), 62–80.
- Piekkari, R., Welch, C., & Paavilainen, E. (2009). The case study as disciplinary convention: Evidence from international business journals. *Organizational Research Methods*, 12(3), 567–589.
- Rialp, A., Rialp, J., & Knight, G. A. (2005). The phenomenon of early internationalizing firms: what do we know after a decade (1993–2003) of scientific inquiry? *International Business Review*, 14(2), 147–166.
- Rialp-Criado, A., Galván-Sánchez, I., & Suárez-Ortega, S. M. (2010). A configuration-holistic approach to born-global firms' strategy formation process. *European Management Journal*, 28(2), 108–123.
- Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2009). Measuring organisational performance: Towards methodological best practice. *Journal of Management*, 35(3), 718–804.
- Riviere, M., & Suder, G. (2016). Perspectives on strategic internationalization: Developing capabilities for renewal. *International Business Review*, 25(4), 847–858.
- Rodríguez, J. L., & Rodríguez García, R. M. (2005). Technology and export behavior: A resource-based view approach. *International Business Review*, 14(5), 539–557.
- Romanello, R., & Chiarvesio, M. (2019). Early internationalizing firms: 2004–2018. *Journal of International Entrepreneurship*, 17(2), 172–219.
- Sadeghi, A., Chetty, S., & Rose, E. L. (2021). Perceived export performance: The invisible part of the iceberg. *Thunderbird International Business Review*, 63(6), 667–686.
- Sadeghi, A., Rose, E. L., & Madsen, T. K. (2021). Perceived export performance: A contingent measurement approach. *Journal of International Marketing*, 29(3), 63–84.
- Sapienza, H. J., Smith, K. G., & Gannon, M. J. (1988). Using subjective evaluations of organizational performance in small business research. *American Journal of Small Business*, 12(3), 45–53.
- Sarasvathy, S., Kumar, K., York, J. G., & Bhagavatula, S. (2014). An effectual approach to international entrepreneurship: overlaps, challenges, and provocative possibilities. *Entrepreneurship Theory & Practice*, 38(1), 71–93.
- Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., & Jinks, C. (2018). Saturation in qualitative research: exploring its conceptualization and operationalization. *Quality & Quantity*, 52, 1893–1907.
- Saunders, M. N., & Townsend, K. (2016). Reporting and justifying the number of interview participants in organization and workplace research. *British Journal of Management*, 27(4), 836–852.
- Schumpeter, J. A. (1942). *Capitalism, socialism, and democracy* (third ed.). Harper & Row.
- Shoham, A. (1998). Export performance: A conceptualization and empirical assessment. *Journal of International Marketing*, 6(3), 59–81.
- Sinkovics, N. (2018). Pattern matching in qualitative analysis. In C. Cassell, A. L. Cunliffe, & G. Grandy (Eds.), *The SAGE handbook of qualitative business and management research methods: Methods and challenges* (pp. 468–484). Sage Publications.
- Sleuwaegen, L., & Onkelinx, J. (2014). International commitment, post-entry growth and survival of international new ventures. *Journal of Business Venturing*, 29(1), 106–120.
- Sousa, C. M. P. (2004). Export performance measurement: An evaluation of the empirical research in the literature. *Academy of Marketing Science Review*, 4(8), 1–22.
- Spencer, A. S., & Kirchoff, B. A. (2006). Schumpeter and new technology based firms: Towards a framework for how NTBFs cause creative destruction. *International Entrepreneurship and Management Journal*, 2(2), 145–156.
- Spyropoulou, S., Katsikeas, C. S., Skarmas, D., & Morgan, N. A. (2018). Strategic goal accomplishment in export ventures: the role of capabilities, knowledge, and environment. *Journal of the Academy of Marketing Science*, 46(1), 109–129.
- Steinhäuser, V. P. S., Paula, F. O., & de Macedo-Soares, T. D. L. A. (2021). Internationalization of SMEs: a systematic review of 20 years of research. *Journal of International Entrepreneurship*, 19(2), 164–195.
- Stoian, M.-C., Rialp, A., & Rialp, J. (2011). Export performance under the microscope: A glance through Spanish lenses. *International Business Review*, 20(2), 117–135.

- Styles, C. (1998). Export performance measures in Australia and the United Kingdom. *Journal of International Marketing*, 6(3), 12–36.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
- Trudgen, R., & Freeman, S. (2014). Measuring the performance of born-global firms throughout their development process: The roles of initial market selection and internationalisation speed. *Management International Review*, 54(4), 551–579.
- Tzokas, N., Hultink, E. J., & Hart, S. (2004). Navigating the new product development process. *Industrial Marketing Management*, 33(7), 619–626.
- Vissak, T. (2023). A literature review on CEE firms' internationalization: Success measurement, achievement and outcomes. *Review of International Business and Strategy, in Press*. <https://doi.org/10.1108/RIBS-06-2022-0061>
- Vissak, T., Francioni, B., & Freeman, S. (2020). Foreign market entries, exits and re-entries: The role of knowledge, network relationships and decision-making logic. *International Business Review*, 29(1). Article 101592.
- Weerawardena, J., Mort, G. S., & Liesch, P. W. (2019). Capabilities development and deployment activities in born global B-to-B firms for early entry into international markets. *Industrial Marketing Management*, 78, 122–136.
- Welch, C. L., & Welch, L. S. (2009). Re-internationalisation: Exploration and conceptualization. *International Business Review*, 18(6), 567–577.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180.
- Westhead, P., & Wright, M. (2011). David Storey's optimism and chance perspective: A case of the Emperor's new clothes? *International Small Business Journal*, 29(6), 714–729.
- Wright, M., Roper, S., Hart, M., & Carter, S. (2015). Joining the dots: Building the evidence base for SME growth policy. *International Small Business Journal*, 33(1), 3–11.
- Yang, M., & Gabriellson, P. (2017). Entrepreneurial marketing of international high-tech business-to-business new ventures: A decision-making process perspective. *Industrial Marketing Management*, 64, 147–160.
- Zahra, S., Ireland, R. D., & Hitt, M. A. (2000). International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance. *Academy of Management Journal*, 43(5), 925–950.
- Zhou, L. (2007). The effects of entrepreneurial proclivity and foreign market knowledge on early internationalization. *Journal of World Business*, 42(3), 281–293.
- Zucchella, A., Strange, R. N., & Mascherpa, S. (2019). Which organisational capabilities matter for SME export performance? *European Journal of International Management*, 13(4), 454–478.