

Exploring Modifications to the Industry Recipe of Multinationalizing Firms

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ABSTRACT

An industry recipe-based approach to internationalization offers managers shared heuristics and mechanisms to accumulate internationalization-relevant knowledge quickly, which is particularly valuable in light of the high uncertainty and knowledge deficiencies that could encumber fast-paced internationalization of entrepreneurial firms. However, there is limited information on how firms undertake recipe modifications, namely deviations from the idealized guidelines contained in the industry recipe, to achieve firm-fit. We therefore seek to understand how generic recipe heuristics become enacted in a firm-idiosyncratic manner. Drawing on inductive case studies of rapidly multinationalizing firms in the SaaS industry, we develop a framework that categorizes recipe modifications into revenue-generating, technology-enhancing and founder-pleasing. This framework advances the industry-recipe based approach to internationalization and furthers our understanding of rapid multinationalization.

Keywords: internationalization, rapid multinationalization, industry recipe, SaaS, digital firms

INTRODUCTION

Many entrepreneurial firms internationalize rapidly to capture and exploit global opportunities (Casillas & Acedo, 2013; Chang & Rhee, 2011; Chetty, Johanson, & Martín Martín, 2014; Oviatt & McDougall, 2005; Reuber, Knight, Liesch & Zhou, 2018; Yang, Lu, & Jiang, 2017). These firms equate slow internationalization with lost opportunity and thus must embrace the challenges involved to capture recognized opportunities across national borders (Bingham, Eisenhardt, & Furr, 2007; Jones & Coviello, 2005; Mathews & Zander, 2007). One form of such internationalization behavior is rapid multinationalization, i.e. the fast-paced transition towards becoming a multinational enterprise (MNE) through the establishment of foreign subsidiaries (Monaghan & Tippmann, 2018; Vanninen, Kuivalainen, & Ciravegna, 2017). Rapid multinationalization by entrepreneurial firms is particularly evident in industries where early mover advantages are critical, pushing the firm towards establishing global dominance quickly. Example firms include Qualtrics, Dropbox, AirBnB, and historically Google and Facebook – all entrepreneurial firms that established foreign subsidiaries as the backbone of their rapid international expansion, complemented by entry modes such as exporting.

Rapid multinationalization, alike other forms of rapid internationalization, poses the challenge of dealing with knowledge acquisition and uncertainty. For entrepreneurial firms who embark on the process of becoming an MNE, knowledge of internationalization, local markets and operating as an MNE are limited, causing substantial knowledge deficiencies. However, there is a need to acquire this knowledge fast to facilitate effective internationalization. Similarly, rapid multinationalization poses high uncertainty as the firms need to act in the presence of incomplete information. This incomplete information may relate to local markets (Johanson & Vahlne, 2009) and is exacerbated by the transient nature of opportunities and dynamic markets (Bingham et al.,

2007; Davis, Eisenhardt, & Bingham, 2009). In order to ameliorate such high level of uncertainty and facilitate fast knowledge acquisition, firms can adopt an industry recipe-based internationalization approach (Monaghan & Tippmann, 2018).

Premised on the concept of industry recipes (Spender, 1989), industry recipe-based internationalization offers managers heuristics, i.e. explicit guidance, or rules of thumb, on how to internationalize in their industry. In the context of software-as-a-service (SaaS) firms, Monaghan & Tippmann (2018) find that the industry recipe pertained to rapid multinationalization, comprising of recipe heuristics, as well as mechanisms that facilitate the application of these heuristics to suit firm-specific idiosyncrasies, the recipe augmentation. While prior research illustrates the critical aspects of an industry recipe-based approach to internationalization, it does not fully illuminate the internal application required by managers to execute an industry recipe effectively.

Although industry recipes are generic, their execution is highly individualistic: Spender (1989) suggests that information deficits exist within firms and an industry recipe addresses some of them; yet managerial creativity in articulating the terms of the recipe to meet the specifics of the firm is essential. For example, as the reliance on industry recipes within environments of high uncertainty, dynamic markets and technological change is insufficient (Sirmon, Hitt, & Ireland, 2007), recipe modifications are necessary to provide for an optimal use of the firm's own resources and capabilities. Moreover, there is great attention assigned to understand and theorize better the challenges associated with accelerated internationalization (Deng, Jean, & Sinkovics, 2018; Reuber, Dimitratos, & Kuivalainen, 2017), including rapid multinationalization, which provide a substantial avenue for exploring how industry recipe modifications enable an effective fast-paced internationalization. However, there is limited available information on how firms that use an

industry recipe-based approach to internationalization transmute the generic recipe heuristics to firm-specific activities. As such, the implementation of recipe modifications, namely deviations from the idealized guidelines contained in the industry recipe, is worthy of greater understanding. Following this, the aim of this paper is to explore the modifications firms make to recipe heuristics to achieve a firm-specific execution of industry recipe-based internationalization. Specifically, we ask: *how do the generic recipe heuristics become enacted in a firm-idiosyncratic manner?*

We conducted eight theory-building case studies of entrepreneurial U.S. firms in the SaaS sector, all of which used industry recipes to pursue, and achieve, rapid multinationalization. Based on a detailed dataset (interview and archival data) and inductive analysis, we demonstrate that firms exhibit deviations from the accepted industry recipe heuristics when applying it and identify the contingencies, or internal and external reasons, which prompt and drive a modified response. Based on these deviations, we develop a framework to categorize recipe modifications, where the modification type is compared to the reasoning for the deviation. From this, we identify three categories of recipe modifications: *revenue-generating*, *technology-enhancing* and *founder-pleasing*. The framework provides two important insights: (1) it shows the main ways in which firms deviate from the rapid multinationalization recipe, and (2) classifies the different types of recipe modifications.

We offer two contributions to the literature. First, we extend the recipe-based internationalization approach (Monaghan & Tippmann, 2018) by adding the element of firm-specific deviation from the recipe, recipe modifications, that have been missing so far. Due to the high demands on the firms in undertaking rapid multinationalization, there is considerable nuance to the firm-specific adaptations required to achieve rapid multinationalization. In so doing, we demonstrate how the firm relates to the industry recipe and modifies the received knowledge to

further their international expansion. Second, we contribute to the emergent discussion on rapid multinationalization. We show that, although this fast-paced transition towards an MNE is propelled by the existence and adoption of internationalization industry recipes, it requires skillful and knowledgeable execution to achieve firm fit within the context of important knowledge-based and firm-based challenges. As such, we consider the influencing factors that are important for rapid multinationalisation as founder logic and business economics, moving beyond the identification of internal and external contingencies on internationalization to illustrate the response of the firm, particularly within rapid multinationalization.

THEORY

When moving into international markets, firms seek to build their knowledge and attempt to reduce the uncertainty associated with entering new markets (Johanson & Vahlne, 1977; 2009). This is particularly evident in entrepreneurial firms, which may not have substantial prior knowledge and are exposed to significant uncertainties. These uncertainties not only relate to incomplete information pertaining to internationalization but also the typical context of entrepreneurial firms that involves transient opportunities, dynamic markets or emerging technologies that cause considerable unknowns (Bingham et al., 2007; Davis et al., 2009; Kitz & Welch, 2018). In such situations, entrepreneurial firms may draw on industry recipes to reduce the uncertainty and knowledge deficiencies associated with internationalization (Monaghan & Tippmann, 2018).

In terms of reducing knowledge deficiencies, the knowledge acquisition afforded by using industry recipe-based internationalization is externally oriented. An industry recipe provides insights into the recipe heuristics for a specific industry and mechanisms of recipe augmentation, which allow firms to quickly access and build critical knowledge necessary to internationalize.

Beyond internationalization, research on industry recipes has been beneficial in understanding a range of organizational phenomena including knowledge processes (Brown & Duguid, 2001; Spender, 1996), resource management and configurations (Mahoney & Pandian, 1992; Sirmon et al., 2007) and sense-making (Inkpen & Tsang, 2005; Stoian, Dimitratos, & Plakoyiannaki, 2018), where they provide common and integrative guidance on how to operate within an industry and a means of overcoming knowledge deficiencies.

The first dimension of internationalization based on industry recipes relates to recipe heuristics, which is the broad rules of thumb on what to do. Heuristics, as rules of thumb, are cognitive shortcuts that allow managers to make sense of a decision situation in the presence of incomplete information (Bingham & Eisenhardt, 2011; Eisenhardt & Bingham, 2017; Eisenhardt & Sull, 2001), such as internationalization decisions (Bingham et al., 2007). In contrast to firm-level heuristics, the recipe heuristics of an industry recipe are shared among the stakeholders of an industry. In the instance of rapid multinationalization in the SaaS industry, three sets of recipe heuristics were identified (Monaghan & Tippmann, 2018). First, organizational structure heuristics pertain to the most appropriate international organization of business functions, including local subsidiaries, regional headquarters, and sales offices. The specific heuristics of organizational structure included building hub-satellite operations, investing in regional headquarters and following the sun/time zone model. Second, location choice heuristics relate to the selection criteria for delineating subsidiary locations, such as locating in a specific environment to access local talent, choosing a cost-efficient location, and identifying and choosing a typical continental entry point. Finally, market selection heuristics refer to the choice of country markets, with the specific rules of thumb relating to following widespread/large market potential, prioritizing countries that are early/fast adopters of technology and being cautious about Asia. These three sets

of heuristics of the rapid multinationalization recipe provide firms with important knowledge to initiate fast-paced international growth. While facilitating internationalization action despite high uncertainty, the recipe heuristics only provide partial guidance for firms, for example, because they do not suggest any specific internationalization actions.

The second dimension of industry recipe-based internationalization, recipe augmentation, is premised on the fact that the generic heuristics shared among stakeholders of an industry need to be re-embedded into the local conditions of the firm (Brown & Duguid, 2001). As each firm faces unique conditions, many firms do not fit the ‘ideal type’ proposed by the recipe, at least not in its entirety. Therefore, managers need to find a compromise during execution to achieve a firm-fit, leading to decisions that are not solely directed by the heuristics of the recipe. In fact, “creative amendment” is often required when applying the industry-level heuristics to the firm-specific circumstances (Spender, 1989: 176). As such, recipe augmentation defines the process by which firms apply the recipe heuristics to suit their own circumstances given its unique challenges and multi-faceted complexities (Monaghan & Tippmann, 2018). It involves knowledge acquisition so that firms can identify, source and internalize the knowledge necessary to undertake specific internationalization action. The mechanisms of recipe augmentation for rapid multinationalization in the SaaS industry included cherry-picking skills and contacts, quick cycles of action and regulating speed (Monaghan & Tippmann, 2018).

As a firm acquires more internationalization-relevant knowledge, it enhances its capacity to conceive of and implement “creative amendments” to the industry recipe. Conceiving of such creative amendments is essentially a reflection of the subjective and tacit knowledge held by individuals within the firm (Spender, 1996; Tsoukas, 1996). Therefore, prior research has focused on the development of managerial capabilities, knowledge and human capital to facilitate changes

beyond the industry recipe (Fainschmidt, Nair & Mallon, 2017; Raffiee & Coff, 2016; Stoian, et al., 2018). Implementing such changes would lead to variation in the exact ways in which the industry recipe is applied and may include recipe modifications. Recipe modifications represent a form of deviating from the recipe, where the executed internationalization actions deviate from the rules of thumb offered by the recipe heuristics in their pure form.

These modifications may be made in response to internal or external factors, or contingencies, facing entrepreneurial firms undertaking rapid multinationalization. In terms of internal factors, these primarily relate to the resources available within the firm, including prior knowledge, financing, human capital and networks (Li, Li, Goerzen, & Shi, 2018). Each firm has an idiosyncratic bundle of such resources (cf. Penrose, 1959), which will direct the execution of the industry recipe and perhaps result in modifications. Li et al. (2018) highlight that due to their liabilities, small firms must quickly cultivate new knowledge and resources at an early stage of their internationalization to try and prepare for complexities of new international markets and facilitate a timely response to new opportunities. As such, the capacity for firms to identify and integrate resources is another important factor (Sapienza, Autio, George & Zahra, 2006). Networks represent a key attribute of accessing novel information, building important connections, overcoming outsidership and developing key capabilities (Coviello, 2006). In addition, there may be certain internal actors that have a strong influence on internationalization actions, such as suggesting and promoting modifications from the industry recipe. For example, many of the determinants and attributes of a firm and their internationalization trajectory are associated with the imprinting functions of the founder(s) and the original founding team (Baum & Bird, 2010; Ganotakis & Love, 2012). Beyond the founder, Fernhaber and McDougall-Covin (2009) show venture capitalists can strongly shape the internationalizing strategy of their portfolio firms.

Indeed, there is evidence which highlights that industry uncertainty can influence the decision of venture capital firms to retain founder-CEOs while going public, in order to keep important human capital (Pollack, Fund, & Baker, 2009). In terms of the external factors, significant attention has been assigned to the role of geographical location for entrepreneurial firms. It has been found, for example, that such firms struggle to access resources necessary to internationalize if located distant from industry clusters (Fernhaber, Gilbert, & McDougall, 2009). Institutional distance between countries is also a challenge, which is salient for digital firms (Deng et al., 2018). Another external factor is the uncertainty of industry and technological conditions, which has a particularly strong influence on the internationalization of high-technology firms where the tension between innovation and internationalization are quite dominant (Kriz & Welch, 2018). In fact, the uncertainty and volatility of technological markets is a key concern for firms sustainability and growth (Eisenhardt, Furr, & Bingham, 2010; Rindova & Kotha, 2001). Moreover, the expansion of micro-multinationals is driven by the knowledge from internal actors on the product, industry and markets, but facilitated by external actors, like advisors in law, international business and accountancy, who contribute functional knowledge to the process (Stoian, Dimitratos, & Plakoyiannaki, 2018).

Effectively, there may be a multitude of internal and external factors why firms may seek to modify an internationalization recipe. We propose that such factors will lead to distinct variation in how firms interpret and apply the industry recipe. In addition to achieving a tight firm-fit, such firm-specific application of the generic industry recipe may lead to differentiation, allowing competitors within an industry to create a unique advantage and optimal distinctiveness (Deephouse, 1999; Zhao, Fisher, & Lounsbury, 2017). They may also allow firms to execute on opportunities more quickly as the firm action is more closely aligned and tailored to available

possibilities. While recipe modifications seem like an integral part of an industry recipe-based approach to internationalization, prior research has not yet systematically investigated how the generic rules of thumb of an internationalization recipe, or other types of industry recipes, get modified at the firm level. To address this gap, we seek to show how the generic industry recipe of rapid multinationalization becomes enacted in a firm-idiosyncratic manner, by outlining the effective modifications implemented by firms in their execution.

METHODS

Research Design and Sample

The explorative nature of the research question is most suited to a qualitative case study research design to inductively build theory (Eisenhardt, 1989; Welch, Piekkari, Plakoyiannaki, & Paavilainen-Mäntymäki, 2011). In particular, very little is known, both theoretically and empirically, about modifications to industry recipe-based internationalization, necessitating theory building. In addition, the complexity of the phenomenon—the contingencies driving deviations from the industry recipe for rapid multinationalization and the subsequent modifications—was well suited to an in-depth case study approach. To facilitate more-generalizable findings, we investigated eight firms (Eisenhardt, 1989; Yin, 2014).

Our research setting was entrepreneurial firms pursuing rapid multinationalization via the industry recipe in the SaaS industry. We used theoretical sampling to focus our inquiry on theoretically useful firms (Eisenhardt, 1989), using sampling criteria to introduce variation along two factors expected to influence patterns in rapid multinationalization and so recipe modifications. One criterion was diversity in countries of original-firm founding, to develop theory applicable to firms of various geographic start-up backgrounds. While all our sampled firms were

headquartered in the U.S. when they undertook rapid multinationalization, some were originally founded in other countries. Imprinting may give high-potential start-ups founded outside the U.S. international networks and market knowledge relevant to accelerate their internationalization (Drori, Honig, & Wright, 2009). An additional criterion was difference in firm age—comprising new, young, and more-established firms—to build theory applicable to a broad range of firm ages. Younger firms tend to have fewer organizational rigidities, allowing them greater nimbleness and flexibility, while established firms may have more-developed organizational capabilities and knowledge (Aldrich & Auster, 1986). Following established cut-off points (Bantel, 1998; Covin, Slevin, & Covin, 1990; Knight & Liesch, 2015; Zahra, Ireland, & Hitt, 2000), we classified firms aged less than six years as new venture, between six and 12 years as a young firm, and older than 12 years as established. Our chosen firms were Alpha, Beta, Gamma, Epsilon, Zeta, Kappa, Sigma, and Omega, and their characteristics are summarized in Table 1. The name of the firms are pseudonyms to preserve their anonymity, and we also disguise specific details relating to their locations and offerings to safeguard confidentiality.

<Insert Table 1 about here>

Data Collection

Archival data. Given the media interest in—and active external communication of—many entrepreneurial firms that expand rapidly, we collected an extensive body of publicly available information on our sampled firms. We conducted a comprehensive longitudinal search on the activities of the sampled firms since inception, including newspaper/magazine appearances (searching the Nexus database by firm name); company press releases and blogs (available on companies' websites); and personal blogs, interviews, and talks by founders, CEOs, and executives

involved in international expansion (searching by firm and key-executive names). Some data included video recordings. In total, 2100 pages of archival media data was collected and 20 hours of video material. This data offered valuable information on the behavior and process of each firm in its international expansion, guided the construction of the historical timelines of events, and provided useful background for the interviews.

Interviews. Given our intent to build theory from a rich set of qualitative data, we used purposeful sampling, specifically the maximum-variation sampling strategy (Patton, 2015), to select interviewees. Headquarters respondents included firm founders, senior executives, and managers overseeing international expansion; subsidiary respondents included managers in leadership positions charged with developing the regional/country operations. Preliminary discussions with an executive/founder of the firm identified key informants. Wherever possible, we also interviewed the venture capitalists or other advisers, who were firm partners and usually served on the board of directors. Here, we used details of board members and venture capitalists, who backed the firm or were mentioned during company interviews as key advisers, to establish contacts. Gathering data from these three perspectives—headquarters, subsidiary, and venture capital partner/adviser—offered a holistic view on the rapid multinationalization from multiple perspectives. In total, we conducted 46 interviews.

All interviewees were directly involved in advising on, making, or executing international expansion decisions, facilitating a detailed and nuanced perspective. In addition, most respondents were either founding members of the firm/subsidiary or joined relatively early, allowing us to collect first-hand information that captured the entire time-span of rapid multinationalization. Each interview was conducted by one of the two authors, during visits to the firm's offices (25

interviews in the U.S. and Europe) or via telephone or video calls (21 interviews). All interviews took place after rapid multinationalization had started, with the main wave of data collection during spring/summer 2015 and follow-up interviews about six months later. This enabled the capture of retrospective and real-time information (with respondents reporting on the firm's current internationalization activities). In particular, the 11 follow-up interviews mostly collected real-time data. Where information concerned past events, we implemented measures to minimize retrospective bias (Miller, Cardinal, & Click, 1997), including an emphasis on actual firm behaviors rather than personal opinions or beliefs, and interviewing multiple knowledgeable informants.

The interviews were semi-structured, using three similar interview protocols: for founders/headquarter managers, subsidiary managers, and venture capital partners/advisers, respectively. Our questions focused on the drivers and process of international expansion, international growth, and development and coordination of international operations. The fluid nature of the interviews within these topic areas enabled respondents to share specific incidents and events they felt were pertinent. We also encouraged respondents to elaborate on other areas they felt relevant, and to give examples. Where necessary, we used probes to increase the detail of accounts, and prompts to specific events in firm internationalization to ensure information was as complete as possible.

Most interviews lasted around 45 minutes, with some over 1.5 hours. Most interviews were recorded and transcribed verbatim, except for all six interviews with Epsilon, whose legal department granted permission only for note-taking. There, we took detailed notes and transcribed them immediately afterwards. The bottom of table 1 summarizes the data collected.

Data Analysis

Data analysis was conducted concurrently with data collection (Eisenhardt, 1989), which afforded us the flexibility in subsequent interviews to probe themes and unfolding events in the multinationalization of these firms. Furthermore, the analysis was iterative and involved repeated comparison of our data with the framework emerging from the analysis (Miles, Huberman, & Saldana, 2014; Strauss & Corbin, 2008), an approach particularly suitable for investigating new phenomena (Locke, 2001). Following established procedures for multiple case studies, we treated each company as its own discrete ‘experiment’: detailed within-case analysis preceded cross-case analysis (Eisenhardt, 1989; Yin, 2014). We followed two main stages of analysis.

Stage 1: Identifying firm-specific deviations to the rapid multinationalization recipe. We noticed early in the analysis that all eight firms successfully followed an industry recipe-based approach to internationalization by employing the rapid multinationalization recipe of the SaaS industry. Nonetheless, we noticed that the firms also deviated from the recipe heuristics for some decisions. To analyze this in more detail, we sought all evidence where the firms deviated from the recipe heuristics. Deviations were defined as any instance where the firm operated counter to or in contrast to any of the three sets of recipe heuristics - organizational structure, location choice and market selection - as outlined by Monaghan and Tippmann (2018). Using this deductive coding approach (Miles, Huberman, & Saldana, 2014) to identify a deviation, we looked for all evidence in the data where any of the recipe heuristics was applied by the firm. We then carefully assessed, drawing on our multiple data sources, whether its operationalization represented a modification. In total, we identified 14 instances of recipe modifications with Alpha showing three; Beta, Epsilon, Zeta, Kappa implementing two; and the remaining firms - Gamma, Omega, Sigma -

choosing one. While the total number of deviations may appear low, these deviations pertained to important aspects of the firms' internationalization.

In addition to identifying recipe modifications, we also noted the contingency for their deviation from the industry recipe, which effectively related to the firm-specific reason that caused firms to adopt a recipe modification. In line with current understanding, the factors we identified were in response to internal factors - namely emphasis on product development, preference for headquarter control, personal networks and acquisition of technology - or external factors - including, technological readiness of country markets or risks associated with a region. Table 2 presents a list of all recipe modifications.

<Insert Table 2 about here>

Stage 2: Building a framework of recipe modifications. We also noticed that there was some variation in the kinds of recipe modifications undertaken by our sampled firms that varied beyond their classification as relating to either organizational structure, location choice or market selection recipe heuristics. To explain this variation, we sought to identify patterns across the different deviations (Yin, 2014) and used matrix analyses techniques to help in the identification of those patterns that express the differences that we observed across the 14 recipe modification instances (Patton, 2005: 560). Specifically, we used a cross-case comparison approach that defines categories by inspecting the cases to see whether groups based on the shared patterns can be formed (Miles et al., 2014). We also used the technique of "stacking comparable cases" (Miles et al., 2014: 103) to continue our systematic cross-case comparison for the identification of themes, or dimensions, that described best the differences between the identified groups. We noticed that groups could be classified along two dimensions: The *modification type*, i.e. the kind of deviation from the idealized guideline; and the *reason*, i.e. the rationale for the deviation. Within

modification type, we could differentiate between a relaxed application of the industry heuristic and the use of a new, additional firm heuristic. We identified five different types of reasons, which were derived from the contingencies identified as driving the modification, including emphasis on new product development and acquisition of technology, personal networks, technological readiness of the market and the risks associated with of markets. A business and founder logic summarized best the rationalities for recipe modifications.

We then created a two-by-two framework, using these two dimensions of modification type and rationale, and populated the cells with the respective recipe modification instances. Comparing and contrasting the instances within each cell, allowed us to identify three category classifications of recipe modification. These categories are revenue-generating, technology-enhancing and founder-pleasing. In combination, these three categories described all recipe modifications undertaken by our sampled firms thus representing an appropriate synthesis of our qualitative data (Patton, 2015).

We incorporated several measures to ensure the trustworthiness of our data and analysis. Within data collection, we guaranteed confidentiality to promote depth of access to our case firms and accuracy of interview information, and a single case study protocol was applied for all firms. In analyzing the data, we maintained a chain of evidence to record data collection steps and analysis decisions and used qualitative data analysis software to implement a systematic analysis. Moreover, all data evidence was triangulated within and across data sources, both authors triangulated the emergent findings by coding the data, questioning and challenging each other's coding to arrive at an agreement.

FINDINGS

Through our detailed investigation of the nature of each deviation, we were able to compile a framework to categorize recipe modifications, visualized in figure 1. One dimension of this framework relates to the *modification type*, differentiating between a *relaxed application of the industry heuristic* (i.e. following the heuristics offered by the generic industry recipe but choosing to execute it in a strong or weak form) and an *additional firm heuristic* (i.e. introducing a heuristic that is not part of the generic industry recipe but present within the firm). A relaxed application of the industry heuristic was evident across all three sets of heuristics – organizational structure, location choice and market selection; and the use of an additional firm heuristic for organizational structure and market selection. The second dimension refers to the *reason*, distinguishing between a *business logic* (i.e. a rationale for the recipe modification that is grounded within management thinking) and *founder logic* (i.e. a rationale for the recipe modification that is grounded within the personal preferences of the founder). We observed the business logics for modifications to the organizational structure, location choice and market selection heuristics; whereas the founder logic was only evident for organizational structure and location choice. Following this, we could identify three categories of recipe modifications - *revenue-generating*, *technology-enhancing* and *founder-pleasing*. We will now present each of these categories, drawing on illustrative examples from the firms to substantiate each category.

<Insert Figure 1 about here>

Revenue-generating Modifications

These modifications were undertaken to foster the rapid international growth of the firms, responding to selected opportunities for greater sales growth internationally. In terms of their nature, revenue-generating modifications had a relaxed application of the industry heuristic and

followed a business logic. A relaxed application of the industry heuristic signaled that the firms were cognizant of the merit and significance of this heuristic in pursuing growth, but their resources and capabilities allowed them to execute this with more, or less, emphasis than guided by the recipe. Combined with this was a strong business-led rationale, here the optimization of the overall growth of the firm in terms of revenue generation through factors such as technological readiness of country markets, personal networks and risk of markets. We found that 5 of the 14 recipe modifications fell into this category.

For Epsilon, their internationalization strategy was quite intense and aggressive, signaling the need to deviate from one of the heuristics contained in the rapid multinationalization recipe. The market selection heuristic related to being cautious about Asia, but despite this, Epsilon opened a subsidiary in India to capture the revenue opportunities in this geographic region with a sales presence on the ground. In particular, the technological readiness of the Asian market was a key factor in their decision. Although they were evidently aware of the risks involved, insofar as Epsilon described the Asian market as *“much distributed and much more diverse”*, they were drawn to invest in building out their product in the market, as explained by the VP of EMEA:

“Expanding to Asia is different because you only have limited resources but because it’s so geographically distributed and diverse, you have to focus resources. We also follow a different approach to sales in that region, where we focus more on inside sales run out of the subsidiary in India and only have a very limited number of field sales staff, currently only 1 or 2 for China and India”.

While the market selection heuristics state that firms should be cautious of Asia, Epsilon chose to enter India due to customer demand for their innovative SaaS offering. As such, the rationale behind the decision to modify the recipe was premised on a business logic of technological readiness of customers in those country markets.

Another example of a revenue-generating modification could be seen in Beta, where the firm opened an office in Japan despite the market selection heuristic of being cautious of Asia. However, due to a strong customer demand and a positive relationship with a local content partner, Beta recognized that their entry into Asia would be more feasible due to some localized personal networks. The CFO of Birch noted *“I have done Japan a couple of times, so I knew who to ask for and what documents to add. So I had experience and it was a little easier for me ... I worked at Visa where I have a lot of relationships and used some of those guys to get the right payment process. And then negotiations was fairly simple as well because, again I had the knowledge about what pricing should be for that service. And so it was more my experience and my background that helped make it easier”*. Nonetheless, despite these personal networks, the specifics of their entry - particularly the financial component of their business - required the development of local relationships and some localization of services. The CFO of Beta explained:

“Japan was a huge opportunity for us, but in order for it to be successful, once again, we had to have the proper operational support vis-à-vis payment; being able to collect the different forms of payment that are offered to the Japanese market. We needed to work with a local Japanese company to provide those services for us. Our payment processes here in the U.S. didn’t quite have the same reach to be able to capture all the different payment methods available in Japan. So in talking with these companies, in order to contract with them they’re like “Well, we only contract with Japanese companies.” So that led to the point of establishing a Japanese entity. The second reason was also banking. Our Japanese partner that we had established a relationship with in digitalizing content, were receiving a revenue share, and they wanted to also start getting paid in Yen. So there are ways to work around that, but at the end of the day if we’ve already had to set up an entity in Japan for contracting purposes we’re also [going] to establish a bank account there to be able to simplify the payment process with our partners out there.”

Following the successful entry and partnerships in Japan, the respondent also spoke about the firm’s interest in building out the office to serve as *“an Asian hub to support more of the localities out there”*. This substantiates the revenue-generating business logic of this modification, whereby

their decision to invest in Japan offered sufficient growth potential to counter the suggested caution of entering Asia.

Another example of a revenue-generating modification was a very refined use of the heuristic of prioritizing countries that are early/fast adopters of technology, one of the rules of thumb relating to market selection. This was evident in Zeta, where the executives identified the merit in pursuing a fast follower strategy for choosing country markets for revenue generation.

The Director of Strategy explained:

“It is definitely about capturing revenue; it’s also about market timing. Zeta has grand visions for the future, and being a truly global company is one of the main pillars. We see tremendous potential for the product that we have created in countries across the world [...] In most of the markets where we have launched, we have not been the first company to market, we are typically the third or fourth company. We actually think that that’s ideal. The companies in our space are changing the way that advertising has historically been done, and so if you are the first entrant into a new country, there is a lot of educating of the market that needs to happen before customers start to adopt the product. So it works in our benefit if we are not the first, but we come maybe a year after the first player, because that first player has done a lot of the leg work, such as educating the market, preparing the market for our types of products. And then we swoop in with a very compelling pitch, a differently-shaded product, and catch them if they are ready to hear our story. So we found that this has worked really well across Europe and is working incredibly well for us in Australia [...] Our main competitor had arrived in Australia about 9 months before us [...] we arrived with a differently-shaded product, very compelling story, and our team has just hit the ground running, with our fastest market ramp ever.”

The decisions by the executives of Zeta to apply a more refined version of a market selection heuristic was clearly driven by a business logic of fostering a fast increase in sales by following other competitors into a new market.

Given the importance of rapid growth in sales for SaaS firms, revenue-generating modifications made an important contribution towards the firms’ key objective. While the heuristics of the rapid multinationalization industry recipe all had an economic logic, i.e.

“rationalities that optimize the firm’s use of its scarce resources for value creation”, such as the maximization of revenue generation (Monaghan & Tippmann, 2018: 480), if it was possible for firms to implement revenue-generating modifications, then this offered valuable additional benefits to the firms.

Technology-enhancing Modifications

These modifications were motivated by a desire to build and strengthen the technological capabilities of the firms to ensure continued product innovation in the dynamic SaaS sector. In relation to the nature of technology-enhancing modifications, they involved additional firm-based heuristics that were not part of the rapid multinationalization industry recipe but were firm-specific rules of thumb. An additional heuristic signaled that the firms had identified a new heuristic for its decision making on internationalization, which was not represented in the recipe but proved valuable in pursuing an opportunity or building out their capabilities. Combined with this was a strong business-led rationale, where the firm was driven to execute their firm-based heuristic to sustain high growth, in this case by contingencies relating to emphasizing new product development and acquiring new technology. In terms of prevalence, 7 of the 14 recipe modifications were in this category.

Within Beta, they established a regional headquarters for EMEA, in line with the organizational structure heuristic of investing in regional headquarters. However, due to their focus on building out a novel product, which could benefit from software development talent in the local region, their regional headquarters included a heavy emphasis on engineering as well as research and development, rather than sales and customer support – which was the primary emphasis of the recipe heuristics:

“A business team for the enterprise platform was based in headquarters in the U.S., but we also wanted an engineering development team focused solely on that product, and we wanted to build that out here [Ireland]. That was one of our objectives for coming out here, and so we started building the team out here with that mindset. We had a couple of our project managers and a couple more of our heads of engineering come to the office here to help with the process of getting things set up and started. It was very small at first and then we rolled it out over time. We felt that there is a lot of talent in Ireland in terms of engineers who have worked at other enterprise businesses and we felt that it would be a good place for us to build our team”. (Beta, Subsidiary Manager).

This emphasis on new product development was an additional firm-level heuristic that Beta executives used in their decision making and stretched beyond the rules of thumb contained in the rapid multinationalization industry recipe for SaaS firms. It also represented a business logic as the rationale, expressed by the Subsidiary Manager in the quote above, related to building dedicated engineering teams as a foundation for growth in the EMEA region.

Another interesting example was Epsilon, a firm that also applied a new, additional firm heuristic to enhance their technology in their opening of a user platform in Israel. This platform fostered a community of vibrant software developers in the local market. Although informal in its operations, it was highly successful in terms of generating new innovations. According to archival data from Epsilon:

“The Epsilon Meet Up Group is a discussion hub for 700 developers across Israel. This highly engaged community has set up 15 meet-ups in the last few months, all of which have been well attended... By hiring talented professionals, we invest in Israel and expand our presence and capabilities within the region. We're proud to sponsor and participate in the many community events being coordinated around the country.”

Cognizant of the activity amongst users, Epsilon established a more formalized platform in Israel to respond to local demand and formalize the existing community into a more integral

dimension of the business. This new heuristic was unprecedented in the industry recipe, but reflected a key customer-led modification to the recipe to enhance their technology.

While most of the growth of our sampled firms occurred organically by scaling their tried-and-tested business model across geographic markets, two of the firms (Zeta and Sigma) explicitly embraced acquisitions of other SaaS technologies as a way of enhancing their own technological capabilities. This was also an additional firm heuristic that was not part of the rapid multinationalization recipe and reflected a strong business logic in terms of building technological competence. The Director of strategy of Zeta explained:

“I also lead our mergers and acquisitions (M&As) in what we call corporate development, and that is both domestic as well as international. It’s understanding the landscape of M&As and owning the strategy for which types of companies Zeta should think about acquiring, going out and identifying the potential acquisition targets, the most promising ones, meeting with them, putting in that due diligence where an acquisition makes sense, negotiating and closing a deal, and then integrating the acquired team. Over the past year, we have done two acquisitions, both of them international. We acquired a 50 person U.K. - based company and, more recently, a much smaller company based in Sweden.”

The rapid multinationalization industry recipe in the SaaS firms is largely oriented towards market seeking objectives for revenue growth. As such, technology-enhancing modifications represented an additional heuristic premised on the rules of thumb of the firm, where the early and substantial internationalization of R&D and international, technology-seeking acquisitions were used to boost the technological capabilities of the firms to remain competitive, and ensure sustained growth, in the dynamic SaaS sector.

Founder-pleasing Modifications

These modifications were implemented due to personal preferences of the firm founder(s). All our sampled firms were privately owned and had received significant venture capital funding, so that

at least one venture capitalist served on the board of directors. Nevertheless, all founders had retained a considerable level of control, affording them a lot of scope to make decisions that aligned with their personal preferences. It does not mean that those decisions had no business rationale; it simply meant that there was a strong personal reasoning driving the decision. Evidence of this was the simultaneous application of the industry heuristics, following their economic logic to optimize scarce resources for value creation, but in a relaxed way. In total, 2 of the 14 industry recipe modifications were founder-pleasing. These modifications were associated with personal networks and demands for control.

Within Gamma, the organizational structure of the firm involved limited dispersion of support functions away from headquarters. Contrary to other firms, and the heuristics of the rapid multinationalization recipe that implied building hub-satellite operations with significant decision making authority in regional headquarters, Gamma retained many of their key support functions within the U.S. headquarters. It did not intend to build these key functional units in the regional headquarters or other international subsidiaries:

“The types of work that is undertaken in the separate offices is fundamentally very different. Ireland is very much an engineering hub, and the U.S. is very much sales. The management decisions don’t come from Ireland, it is driven by the U.S. - It’s like an U.S. entity now with a U.S. engineering facility in Dublin.” (Gamma, Legal Counsel).

Indeed, the respondent spoke to some earlier challenges with a local office in the United Kingdom, signaling the desire for Gamma founders to retain all support functions within a central locus of the U.S. headquarters.

The other example of founder-pleasing modifications was evident in Alpha. For personal networks, Alpha opened a R&D subsidiary in Eastern Europe. Their chief scientist was a native of the Czech Republic, with a young family and kids. He had retained strong personal research

networks with the local university, where he had completed his PhD in Computer Science. This decision had a strong personal motivation of returning to his home country; while also making use of the location choice heuristics contained in the rapid multinationalization recipe of choosing cost-efficient locations and locating to access talent.

As the firms undertaking the rapid multinationalization recipe were seeking to capitalize on significant global opportunities within a highly dynamic industry and under strong time pressures, there was a strong understanding among the founders and senior executives that decisions regarding modifications could be made by quickly. As they are premised on contingencies related to new product development and control of operations, the founders recognized the opportunity for aggressively pursuing and building out new innovative opportunities and so the founder-pleasing modifications represent the capacity for founders to contribute to the decisions of the firm, while still adhering to the generic industry heuristics available to them.

Interestingly, we did not find any instance whereby modifications fell into the category of being premised on an additional firm heuristic and following a founder logic - a quadrant we titled *zone of unviability*. This seems to suggest that the use of an additional firm heuristic, as a strong form of deviating from the heuristics commonly used by SaaS firms to multinationalize, requires a strong business logic. In the firms that we studied, major internationalization decision required approval by the board of directors. The Co-founder and Executive of Sigma explained: *“If you go to Ireland, you get a very different response from the board. If you go to the board; “we are going to Ireland”; it doesn’t scare anyone. If you say: “we are going to Berlin” or “we are going to France”, they start asking you a million questions. And you need to work hard to support the decision”*. As such, it can be deduced that founder preferences are not sufficient in convincing the

board. This aligns with extant literature which highlights that venture capitalists, who served on the board, influence internationalization strategies (Fernhaber & Mc-Dougall-Covin, 2009) and are also aware of the rapid multinationalization recipe and its idealized decision heuristics (Monaghan & Tippmann, 2018).

DISCUSSION

Industry recipe-based internationalization explains how entrepreneurial firms can internationalize successfully by drawing on externally available shared heuristics, but also how they do so in a way that is sensitive to firm-specific circumstances. While prior work delineated the recipe heuristics and recipe augmentation (Monaghan & Tippmann, 2018), understanding recipe modifications has been an important missing element in substantiating an industry recipe-based approach to internationalization. We, therefore, set out to explore *how the generic recipe heuristics become enacted in a firm-idiosyncratic manner*. Based on our study of eight SaaS firms, that had adopted the rapid multinationalization industry recipe, we develop a framework of industry recipe modifications. Next, we elaborate how our framework advances theory and outline limitations, future research avenues and managerial implications.

Industry Recipe-based Internationalization

Our main contribution is to advance the industry recipe-based approach to internationalization (Monaghan & Tippmann, 2018). Following Spender (1989), we have conjectured that the execution of an industry recipe for internationalization may require firms to deviate from the industry-level rules of thumb, in the form of recipe modifications. We find all sampled firms implemented modifications to the rapid multinationalization recipe of the SaaS industry.

Importantly, these modifications and firm-specific contingencies reveal how firms engage with the essence of the rapid multinationalization recipe in the SaaS industry within the realities of their organization. Given that our firms were all successful in conducting rapid multinationalization, our findings thus substantiate how industry recipes can be effectively used. Additionally, our findings illustrate some concrete ways in which recipe-based internationalization, despite being premised on generic industry-level shared heuristics, is malleable. In particular, the three categories of recipe modifications - revenue-generating, technology-enhancing and founder-pleasing - suggest specific options for making a creative contribution during the execution of an industry recipe for internationalization.

Moreover, we identify an important difference between the relaxed application of a recipe heuristic and a new firm heuristic. In this respect, the differentiation between a relaxed application of industry-level recipe heuristics and the addition of new firm-specific heuristics makes an important contribution because it adds to findings that managers of entrepreneurial firms often use heuristics to guide their strategic decision-making (Eisenhardt & Bingham, 2017; Bingham & Eisenhardt, 2011). As such, firms not only tailor generic heuristics to their firm, but also choose actions that were not directed by the industry recipe but their own, firm-specific heuristics. Thus, deciding upon recipe modifications reflected a ‘maturity’ of the firm as it signaled deviations from what was generally seen as the most appropriate way to gain global dominance in the SaaS industry. Achieving such maturity was facilitated by fast knowledge acquisition, through recipe augmentation (Monaghan & Tippmann, 2018), because this allowed the firms to build the expertise needed to decide on modifications. This maturity was not necessarily a determinant of age, or internationalization stage, but rather was indicative of the firms’ engagement with the industry recipe and their capacity to quickly identify and build knowledge.

By showing that the categories of recipe modifications are premised on differences in type and reason, it seems possible that our framework could also apply to other firms beyond our sample, especially firms where the founders hold a strong influence. An examination of recipe modifications in other types of firms, and for other types of internationalization industry recipes, thus offers a fruitful avenue for future research.

Rapid Multinationalization

Our second contribution is to extend understanding of how firms can achieve rapid multinationalization. Rapid multinationalization, as a specialized form of fast-paced international expansion, allows firms to capture global opportunities by building out more substantial foreign operations than primarily exporting (Monaghan & Tippmann, 2018; Vanninen et al., 2017). Given that this endeavor poses the challenge of dealing with knowledge acquisition and uncertainty, firms apply a rapid multinationalization recipe to ameliorate such high levels of uncertainty and facilitate fast knowledge acquisition. However, while the industry recipes allow firms to overcome many challenges of rapid multinationalization, there are a number of important firm-specific factors which must be accounted for within this.

Similar to prior research, which highlights that there are many factors that influence upon the ability and effectiveness of entrepreneurial firms to internationalize at an accelerated pace, we find that these firm-specific factors are rooted in the alternative internal and external circumstances facing firms. However, our findings differ in that they reveal a concise set of circumstances that drive modifications. In terms external factors, we find that the external environment creates significant implications for internationalizing firms, and firms must identify ways to navigate these whilst working to capture opportunities quickly (Bingham & Eisenhardt, 2011; Kritz & Welch,

2018). Specifically, we demonstrate that the main external factors relate to the technological readiness of the market and the risks associated with markets, which have a direct bearing on the viability of fast-paced internationalization. These factors resulted either in a stalled or slowed international expansion in certain markets while prioritizing others, or an immediate prioritization of favorable country markets, prompting more, or less, application of a heuristic. In terms of internal factors, existing evidence demonstrates the important role of knowledge, financing, human capital and networks for internationalizing firms (Coviello, 2006; Li et al., 2018; Sapienza et al., 2006). Out of those factors, we only found that personal networks can be a reason for recipe modifications. This does not imply that the other factors are not relevant for rapid multinationalization; it only means that we did not observe them in driving recipe modifications. However, to our surprise, we found two future-oriented factors - emphasis on new product development and acquisition of technology - which signal the strong focus on the fast-paced nature of rapid multinationalization and the mechanisms firms enact to prioritize this within highly volatile and dynamic markets.

Interestingly, our findings move beyond the descriptive differentiation between internal and external factors to show an interpretive differentiation between business logic and founder logic. This difference captures the important duality and coexistence of founders' rationality and business economics within privately-owned, entrepreneurial firms that pursue rapid multinationalization. The duality of founder rationality and business economics has been an important topic within strategic entrepreneurship, where leadership is recognized as a significant determinant of firms' performance and growth, and is of even more relevance for entrepreneurial firms where the retention of founder-CEOs is a key decision (Pollock et al., 2009). Our study advances the understanding of this duality as we find that founders will not pursue new heuristics,

but will seek to apply a tried-and-tested heuristic of the industry recipe with more or less emphasis, for example, when attempting to exert control or draw on personal networks. As such, the founder logic is evidence of the overall professionalism of the rapidly multinationalizing firms, where the founder's vision and belief in the company drive the company forward in pursuit of opportunities without 'side-stepping' the tried-and-tested recipe heuristics. Comparatively, the business logic are often associated with technology and networks - more viable and established firm-based resources which allow firms to undertake rapid multinationalization (Coviello, 2006; Li et al., 2018). The business logic aligns with the fundamentals of the firm, in terms of innovation and growth, whilst also allowing fast-paced internationalization. Thus, moving beyond the simple depiction of internal and external circumstances, our findings illustrate how firms categorize and respond to influencing factors.

Managerial Implications

So far, the guidance for founders and managers of entrepreneurial firms on how to pursue rapid multinationalization has been slim, and this paper helps in addressing this issue. First, we show that there is considerable scope for recipe modifications despite following a generic industry recipe to guide internationalization. This should alleviate potential concerns that industry recipes for internationalization may not fit the specifics of a firm, or that firms can only adopt the rapid multinationalization in its absolute, purest form. Second, our framework may help the leaders of these firms in their thinking of recipe modifications. As a significant component of an industry recipe is associated with amendment to suit firm-specific idiosyncrasies and managerial engagement, our findings can guide their creative thought process within categories of recipe modifications that have been identified as viable and nonviable. Third, our findings can help

leaders of those firms in pinpointing some important contingencies that drive recipe modifications. The internal and external factors for recipe modification showcase which specific market and firm situations exist, and illustrate the ways to respond to them within the adoption of the recipe.

Limitations

Although these findings advance our understanding of recipe modifications within the context of rapid multinationalization, we acknowledge there are some limitations to this study. Our research context of entrepreneurial firms within the SaaS industry is not representative of all firms. The SaaS industry is high-tech and dynamic. As such, firms may feel more pushed to respond more aggressively and in a quicker time period to contingencies compared to firms in other industries. Nonetheless, as the SaaS industry is growing at almost 20% per year (Gartner, 2017), it is an interesting context in which to study how firms internationalize and undertake rapid multinationalization. Additionally, at the time of data collection, all eight firms were privately owned and funded through venture capital investment. There is significant evidence to show that the process of going public can create a period of disruption and change to the priorities of the firm and the decision-making power (Zimmerman & Zeitz, 2002). As such, exploration of recipe modifications during the initial public offering (IPO) of firms might be worthwhile exploring (Pollock, Rindova & Maggitti, 2008).

CONCLUSION

While an industry recipe-based approach to internationalization offers entrepreneurial firms the capacity to undertake fast-paced internationalization, such as rapid multinationalization, this study advances understanding of how they do so in a way that is sensitive to firm-specific circumstances.

Based on our study of eight SaaS firms, that had adopted the rapid multinationalization industry recipe, we develop a framework of industry recipe modifications. Recipe modifications, namely deviations from the idealized guidelines contained in the industry recipe, to achieve firm-fit. This framework categorizes recipe modifications into three types: revenue-generating, technology-enhancing and founder-pleasing, and also highlights the zone of inviability, where modifications are not sensible. This framework advances the industry-recipe based approach to internationalization and furthers our understanding of rapid multinationalization.

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TABLES AND FIGURES

Table 1 *Description of sampled firms and collected data*

	Alpha	Beta	Gamma	Epsilon	Zeta	Kappa	Sigma	Omega
Firms								
Age	New venture	New venture	Young firm	Young firm	Young firm	Young firm	Established firm	Established firm
Country of original firm founding	Non-U.S.	Non-U.S.	U.S.	U.S.	U.S.	Non-U.S.	U.S.	U.S.
Data								
Archival sources (media in pages, videos in min)	560 pages, 70 min	210 pages, 110 min	120 pages, 80 min	380 pages, 120 min	370 pages, 60 min	280 pages, 320 min	70 pages, 210 min	110 pages, 230 min
Interviews	7 (HQ: 2, Subsidiary: 2, VC: 1, Advisers: 2)	6 (HQ: 2, Subsidiary: 3, VC: 1)	5 (HQ: 2, VC: 3)	6 (HQ: 4, Subsidiary: 2)	6 (HQ: 2, Subsidiary: 3, VC: 1)	5 (HQ: 2, Subsidiary: 3)	7 (HQ: 3, Subsidiary: 4)	4 (HQ: 2, Subsidiary: 2)

Table 2 *Recipe modifications*

Firms (14 instances in total)	Recipe heuristics		
	<i>Organizational Structure</i> Most appropriate international organization of business functions, including local subsidiaries, regional headquarters and/or sales offices	<i>Location Choice</i> Location choice criteria by which firms focus selection of subsidiary locations and prioritize country markets	<i>Market Selection</i> Selection of entry into new country markets
Alpha (3 instances)	Early and substantial internationalization of R&D <ul style="list-style-type: none"> • Technology-enhancing • Why? Emphasis on new product development 	Subsidiary in Czech Republic <ul style="list-style-type: none"> • Founder-pleasing • Why? Personal networks 	Avoidance of Asia <ul style="list-style-type: none"> • Revenue-generating • Why? Risk of markets
Beta (2 instances)	Regional headquarters more engineering focused than sales/customer facing <ul style="list-style-type: none"> • Technology-enhancing • Why? Emphasis on new product development 		Selection of risky markets like Japan and Brazil <ul style="list-style-type: none"> • Revenue-generating • Why? Personal networks
Gamma (1 instance)	Limited dispersion of support functions away from headquarters <ul style="list-style-type: none"> • Founder-pleasing • Why? Preference for greater control 		
Epsilon (2 instances)	User group platform in Israel <ul style="list-style-type: none"> • Technology-enhancing • Why? Emphasis on new product development 		Subsidiary in India <ul style="list-style-type: none"> • Revenue-generating • Why? Technological readiness of country markets
Zeta (2 instances)		Country selection criteria include preference for fast second mover strategy <ul style="list-style-type: none"> • Revenue-generating • Why? Technological readiness of country markets 	Subsidiary in Sweden <ul style="list-style-type: none"> • Technology-enhancing • Why? Acquisition of technology
Kappa (2 instances)	Early internationalization of R&D <ul style="list-style-type: none"> • Technology-enhancing • Why? Emphasis on new product development 	Subsidiary in Russia and Slovakia <ul style="list-style-type: none"> • Technology-enhancing • Why? Emphasis on new product development 	
Sigma (1 instance)			Quick succession of entry into Asia <ul style="list-style-type: none"> • Revenue-generating • Why? Personal networks
Omega (1 instance)			Subsidiary in Canada <ul style="list-style-type: none"> • Technology-enhancing • Why? Acquisition of technology

Figure 1 Framework of recipe modifications

Reason	<i>Founder logic</i>	FOUNDER-PLEASING Respond to personal preferences of firm founder(s)	Zone of unviability
	<i>Business logic</i>	REVENUE-GENERATING Foster rapid international growth by responding to selected opportunities for sales	TECHNOLOGY-ENHANCING Build and strengthen the technological capabilities for continued technological innovation
		<i>Relaxed application of industry heuristic</i>	<i>Additional firm heuristic</i>
Type			