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Internationalization of China's medical device industry: a case study in Brazil

China's
medical device
industry

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199

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Abstract

Purpose – The singularity of being the first Chinese manufacturer of drug-eluting stents to arrive in Brazil and the country being selected as the company's first experience outside its home country motivated the interest in the study of this case, *vis-à-vis* with the characteristic of internationalization medical device companies according to the Uppsala model. Considering this context, the following research question was outlined: "How did Microport internationalize before the distribution of its stents product in Brazil?" The aim of the study is to investigate Microport's internationalization process for the distribution of its drug-eluting stents in Brazil.

Design/methodology/approach – Exploratory research under the qualitative method was adopted. It chose the single case study as a procedure for data collection, as it is a revealing, exemplary subject that offers opportunities for access to unusual research. The company MicroPort was chosen because in the period when Chinese medical device companies were focused on gaining market share in China, MicroPort began its international expansion, choosing Brazil as the first country to have its own subsidiary. It consists in the case of the internationalization of a high-tech EMNE in an emerging country that has institutional and cultural differences.

Findings – Taking advantage of new technology in highly internationalized environments favors its insertion; the internationalization of medical technology can expand according to the Uppsala Model, which does not explain internationalization, but rather its evolution. Cultural and behavioral issues reinforce that the development of the market for medical devices depends on local perspectives and values. The formation of an ecosystem in the local market for internationalization is observed. One implication of the study is that MicroPort's experience and the application of the Uppsala model for international expansion can serve as an important learning experience for Brazilian multinational companies.

Research limitations/implications – Empirical analysis carried out in the context of a single company. Although the results can be used as lessons learned from the application of the Uppsala model for international expansion of EMNE in an emerging market, caution should be exercised when generalizing its findings. Future studies could carry out comparative cases considering other emerging multinational companies, from the same sector or even from different industries, investing in other emerging markets. There is a limitation of the fact that the case studied does not explore the concepts of the later stages of the Uppsala model.

Practical implications – High-tech EMNEs internationalizing in other markets need to adopt aggressive strategies. The need to adopt different strategies for supply chain operations according to the specificities of the markets in which they operate. Important contributions to the Uppsala model, with regard to the process of passing stages, learning and networking. The findings of this study have similarities to the process described as a sequence of distinct phases of activities.



Social implications – A local top management team is essential to deal with institutional issues of government agencies when EMNE is internationalized in a culturally distant market. When there are major institutional differences between the country of origin and the host country, the autonomy in the management of the foreign subsidiary positively influences the acceleration of the internationalization process of companies in the high-tech sector. When there are major institutional differences between the country of origin and the country of destination, the use of local social networks positively influences the acceleration of the internationalization process of companies in the high-technology sector.

Originality/value – Regardless of these limitations, the study provided an exciting case of internationalization of a Chinese company in Brazil operating in a high-tech medical sector. The challenges for the internationalization of EMNEs continue, which makes it opportune for future studies to include more research in this area. The propositions suggested in the study may be the first step.

Keywords Internationalization, Supply chain strategies, Medical devices, Chinese multinational, Uppsala model

Paper type Research paper

Introduction

There is a strong interest in researching new international ventures, particularly from emerging markets (Mikhailova & Olsen, 2016; Jiang, Kotabe, Zhang, Hao, Paul & Wang, 2020). In the case of multinational companies from emerging countries (EMNCs), there is much to learn by examining their foreign direct investment (FDI) and how these firms use their resources and capabilities in foreign markets (Khan, Lew & Rao-Nicholson, 2020). Interest is even more significant on the movement of Chinese EMNCs, both in developed countries (Buckley, 2019; Sutherland, Hennart & Anderson, 2019) and other emerging countries (Fornes & Butt-Philip, 2014).

There is also an interest in the internationalization of high-tech industries (Khan, Lew, & Rao-Nicholson, 2020), such as medical technology (Laurell, Achtenhagen & Andersson, 2017). However, a critical factor for the success of medical devices' internationalization is to develop distribution channels in the host country (Dalenberg, 2020).

Medical device sales are estimated to reach US\$800bn in 2030 (KPMG, 2018), as diseases caused by lifestyle become more prevalent. In addition, there is an increase in heart risk factors following COVID-19 (Cransac-Miet, Zeller, Chagué, Faure, Bichat, Danchin, Boulin & Cottin, 2021). Around 43% of the drug-eluting stent market will be concentrated in China, India and Brazil, with Brazil accounting for 3% of global sales (Global Data, 2014).

The medical device market in mature countries like the USA, Japan and the European Community is increasingly saturated (Zelkha, 2012). This fact creates interest from multinational companies in new markets with high growth potential, especially in emerging economies (Boyen & Ogasavara, 2013). Therefore, emerging markets are attractive and part of multinationals' expansion strategies focuses on them (Abbot, 2019; Boston Scientific, 2020; Medtronic, 2020).

The internationalization of medical device companies, in which products are first developed locally for the national market and then for the international one (Mikhailova & Olsen, 2016), is in line with Uppsala model's proposal (Johansson & Vahlne, 1977). This theoretical model understands that internationalization depends critically on learning processes and networking, which take considerable time and effort (Johansson & Vahlne, 1977, 2009). Therefore, it is a process-oriented view of internationalization associated with a gradual movement in which business relationships are channels for learning and aligning relevant information and capabilities.

In 2018, the largest medical device companies in the world, such as Abbott, Boston Scientific and Medtronic, already had their operations consolidated in Brazil, where they

dominated the local market but with no manufacturing in the country (ANVISA, 2018). In that period, Chinese companies had a solid performance in the domestic market, with the expansion of China's health-care industry (Euromonitor International, 2018). At the end of 2017, MicroPort, the largest Chinese company in the segment of drug-eluting stents (Boston Healthcare, 2020), established its first foreign subsidiary in Brazil (MicroPort, 2018).

The uniqueness of being the first Chinese drug-eluting stent manufacturer to arrive in Brazil, and the selection of the country to be the company's first experience outside its headquarters motivated the interest for this case study, in addition to analyzing the internationalization of medical device companies according to the Uppsala model. Furthermore, it is the internationalization of an EMNC toward an emerging economy with significant institutional and cultural differences (Thøgersen, Barcellos, Perin, & Zhou, 2015), making it an intriguing case for analysis.

The study contributes to the literature in two main points. First, understanding the internationalization of a high technology medical EMNC to an emerging market with significant institutional and cultural differences. Thus, it is essential to understand the context of the Chinese company MicroPort within the internationalization of the medical device industry, its entry into the Brazilian market and the evolution of the distribution channel strategy in the country. Second, by contributing to the Uppsala model, in aspects such as the learning process, sequence of steps, relationship with local networks and how these aspects apply to MicroPort's presence in Brazil.

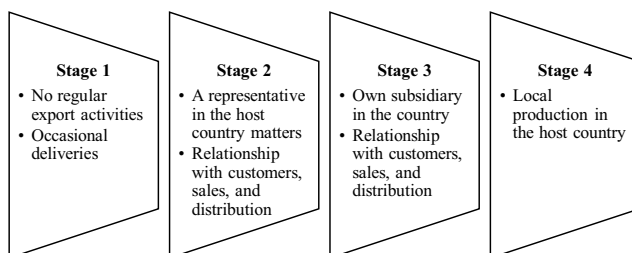
We organized the article into six sections. After the introduction, we present the literature review, followed by the methodological procedures, results, discussion and finally the conclusions, with the main contributions, limitations and suggestions for future research.

Literature review

Uppsala model

The Uppsala model is one of the references for studying the internationalization process of companies (Dow, Liesch, & Welch, 2017). Johansson and Vahlne (1977) developed the model by investigating the international expansion of Swedish companies. According to the authors, companies should learn from their experience of operations and activities in the foreign market. They build experience from their knowledge of the market where they operate, and this knowledge influences the decisions on the level of commitment and the activities that subsequently grow from it, leading to the next level of commitment, which requires more learning.

The model is dynamic and has four stages (Figure 1). According to Hult, Gonzalez-Perez and Lagerström (2020), the first step is exporting to another country occasionally. By gaining knowledge and confidence, the company begins to export regularly, using the



Source: Adapted from Hult *et al.* (2020)

Figure 1.
The
internationalization
process proposed by
the Uppsala model

services of a representative, thus moving on to the second stage. When establishing a foreign subsidiary to distribute its products in a target market, it becomes a multinational company and enters the third stage. The target market may grow enough to justify manufacturing in that country, making the company skip the sales subsidiary stage and move directly to local production, the fourth step (Dow, Liesch, & Welch, 2017). Figueira-de-Lemos, Johanson and Vahlne (2012) observe that this is the typical internationalization path in a stable environment, where the company's commitment increases with the accumulation of knowledge and vice-versa – the acquired knowledge makes the company decide to build a factory in that country.

The model proposed in 1977 was revised in 2009, by describing the business environment as a network of relationships without borders (Johansson and Vahlne, 2009). Although recognizing a global world, the authors confirmed the gradual process of internationalization. This means that *Born Globals* (Knight & Cavusgil, 2004), with international activities since their inception, have actually a more regional scope and do not really cross the world significantly (Johansson & Vahlne, 2009, Lopez, Kundu, & Ciravegna, 2009).

For Hult, Gonzalez-Perez and Lagerström (2020), the application of the model seeks to form an ecosystem composed of business organizations involved in commerce, production, commercial functions and cross-border trade. According to Vahlne (2020), the Uppsala model explains the nature of the globalization process by sharing the characteristics of the internationalization process. However, it is difficult to adapt to the nature of activities and different national and organizational cultures, depending on knowledge development and several mutual commitments (Vahlne *et al.*, 2012).

In the case of medical devices, Lee's study (2018) similarly separates the internationalization process (in stages): *access* through regulation; *expansion* by registering more innovations; and increased *infrastructure*. The study approaches the Uppsala model on the importance of learning, especially in the case of medical devices, which need continuous cooperation for research and development.

Distribution channels

The choice of distribution channels is essential for the implementation of the company's market strategy. These decisions start with collecting the correct information and establishing the goals (Machková, 2006).

Distribution channels are the routes through which goods and services go from producers to customers. There are different types of distribution channels, depending on the number of intermediaries (Kotler & Keller, 2015). The distribution channel is the set of interdependent organizations involved in making a product or service available for use or consumption; the strategy focused on managing distribution channels can bring significant and positive results for companies (Coughlan, Anderson, Stern, & El-Ansary, 2012).

Kotler and Keller (2015) define four potential distribution channels (Figure 2). In the *direct distribution channel*, there are no intermediate levels. In the *indirect channel*, there are three possible configurations:

- retailer;
- two levels (wholesaler and retailer); and
- three intermediate levels, in which the intermediary buys from large wholesalers and sells to small retailers.

Direct distribution channels are more suitable for producers with the ability to sell their products and services directly. The advantages include direct contact and communication with the consumer, effective and immediate feedback, and low costs due to the absence of intermediaries. On the other hand, indirect distribution channels have intermediaries for distribution, who play different roles and can be wholesalers, retailers and different types of agents (Rolnicki, 1998). The advantages are that goods and services sales are more efficient, expenses are lower and the producer does not have to take care of all aspects of the sales process, as the intermediary plays this role.

The choice of distribution channels also depends on the product's characteristics, durability, life cycle, technical level, after-sales services, production capacities and location. In addition, the opportunities for materials and personnel, availability of intermediaries for distribution, the level of services provided, social and economic conditions, financial services and legislation are also part of the process (Machková, 2006).

Methodology

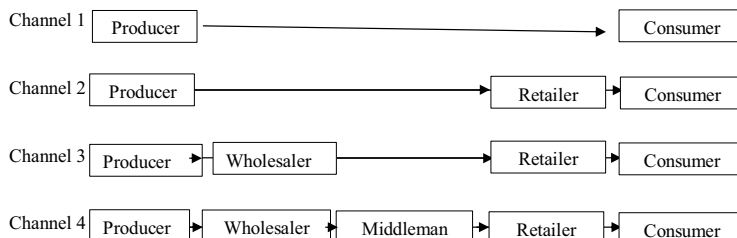
Context and research method

The study's problem regards investigating particularities and understanding details specific to the context. Therefore, we chose qualitative exploratory research.

Theory-building through case studies is a research strategy that involves the analysis of one or more cases to create theoretical constructs or propositions from the empirical evidence provided by the case (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). A single-case study can create more complicated theories than multiple cases because single-case researchers can adjust their theory precisely to the many details of a particular case. By contrast, multiple-case researchers retain only the relationships that are replicated in most or all cases (Eisenhardt & Graebner, 2007).

Based on this assumption, as this is a revealing, exemplary subject matter that provides opportunities for access to unusual research (Yin, 2006; Eisenhardt & Graebner, 2007), we chose the single-case study as the procedure for data collection. In addition, Mariotto, Zanni and Moraes (2014) argue that a single example can challenge a well-established proposition and generate approaches to initial studies like this one, as long as the goal is an empirical generalization.

We chose MicroPort because of some particularities. First, when Chinese medical device companies focused on gaining market share in China, on taking the lead from North American and European companies in their country, MicroPort began its international expansion, choosing Brazil as the first country to have a subsidiary outside China. Additionally, it is a case of internationalization of a (Chinese) high-tech (medical) EMNC in



Source: Adapted from Kotler & Keller (2015)

Figure 2.
Distribution channels

an emerging country (Brazil) that has significant institutional and cultural differences, meeting one of the contributions intended by this study.

MicroPort was founded in 1998, in an incubation center at Zhangjiang High-Technology Park, in Shanghai. In 1999, it launched its first product, a balloon catheter for coronary angioplasty. MicroPort's first entry into the international market took place in 2003, with exports to Japan. In 2004, the European Community approved its conventional stent, and the firm developed its first drug-eluting stent in China. In 2010, MicroPort went public on the Hong Kong Stock Exchange. The approval of its products by the health surveillance regulatory authorities in China (CFDA) and Europe (EC) boosted its business expansion worldwide.

For this case study, we got general information on the company during a visit (SHG) in 2018/2019, and through interviews conducted with the president (E1CEI) and the vice-president of international business (E1VPI). From these first contacts, new interviews emerged with managers from the international areas of operations (E1OPI), regulation (E1RAI) and quality (E1QAI). In addition, we interviewed local managers of the Brazilian subsidiary, from the operations (E1OPB), regulation and quality (E1RQB), finance (E1FIB) and sales (E1VEB) areas. In the interviews, we identified critical events related to developing strategies for internationalization and distribution channels. The focus was on questions such as "what," "why" and "how" about critical events, activities and choices that took place over time (Pettigrew, 1997). This process interpretation provided important events, names and dates that served as a template for a deeper investigation.

After the interviews, we did an *in loco* study, with access to data from primary and secondary sources, such as meeting minutes (ATA1; ATA2; ATA3), seminars' field notes (SEM1; SEM2) and short presentations at annual conferences (CONF1; CONF2), in addition to company's yearbooks. These documents provided a triangulation between written documents and interviews to complement and minimize interviewees' retrospective bias.

Data underwent graphical analysis, which allowed presenting information synthetically (Miles & Huberman, 1994). Visual mapping was supported by further analysis involving a search for patterns or common sequences of events (Buchanan & Bryman, 2009), to advance to mid-range theoretical explanations (Miles & Huberman, 1994).

Results

Based on both primary and secondary data, it was possible to understand MicroPort's internationalization process. It began in 2013, with the development of an innovative product, the *Firehawk drug-eluting stent*. It is innovative because, unlike other similar stents, it releases the drug at the lesion site, achieving clinical results comparable to the reference stents in the market (Lansky, Wijns, Kelbæk, Roven, Zheng *et al.*, 2018). In 2014, overseas revenues from the cardiology segment represented 5% of total income. However, with the advance of the internationalization process, overseas revenue reached the level of 11% in 2020, and, specifically in Brazil, the market share was close to 5%.

Over the years, MicroPort's strategy to go beyond China was to get approval for its products in different countries (E1CEI; E1VPI). Later, the firm looked for local representatives to register products in the target market (E1RAI) and import, receive, store and distribute MicroPort products (E1OPI). This strategy is consistent with the Uppsala model's Steps 1 and 2 and focused on distributing its products without a subsidiary's local and direct presence.

The firm replicated this strategy in Brazil by identifying an exclusive distributor in the country (E1CEI). This distributor met the necessary conditions required by the National Sanitary Surveillance Agency (Anvisa) for registering products in the country, with the required regulatory licenses for import, storage and distribution (E1RAI; E1QAI).

In this first stage, the firm exported products to the distributor (E1OPI). Then, it proceeded to prospect customers, getting the recommendation and experimentation of opinion formers (E1CEI; E1VPI). Thus, MicroPort began distributing its products in the Brazilian market.

MicroPort soon noticed the competitive market in Brazil, where the major market players had already established themselves in specific segments (Medtronic, Boston Scientific, Abbott, Terumo, Biotronik) (E1CEI; E1VPI). Because of increasing awareness in Brazil about the various heart diseases and the growing number of older people in the country, the company expected a significant increase over the following years (E1CEI; E1VPI). Despite being the largest market in Latin America, Brazil did not know MicroPort's best performance. Countries like Argentina, for example, with the same distribution model, showed equal or better performance (E1CEI; E1VPI). Given the country's characteristics and the unmet potential, MicroPort then decided to go beyond Step 2 of the Uppsala model and establish its first subsidiary outside China, with the primary goal of boosting its market share with the Firehawk drug-eluting stent as its leading product (E1CEI; E1VPI).

In 2017, after a period of selling products through the exclusive distributor, the company sought a better structure by establishing a local subsidiary and hiring three Brazilian professionals:

- technical manager (Pharmacist);
- operations manager; and
- sales manager (E1CEI; E1VPI; E1OPI; E1RAI).

It also started transferring product registration to the subsidiary since the distributor has the record from previous sales (E1RQB; E1RAI; CONF1; ATA1).

Next, the process to get the operating permit (AFE) from Anvisa began (E1RQB; E1VPI; E1RAI; SEM2) and thus allowed import, store and distribution of products on its own (E1OPI; E1OPB). Finally, the company received authorization to start its activities in 2018, getting an unlimited import license (E1FIB; ATA2; CONF2). As a result, the first Firehawk import to Brazil was in September 2018 (ATA1).

The Brazilian subsidiary started to perform all supply chain activities locally, from planning to the arrival of products in the country (E1OPB; E1OPI; ATA3; SHG; SEM2). The activities include transferring products to a customs storage station (EADI) to await Anvisa inspection. After approval, the process proceeds to the Internal Revenue Service (E1RQB; E1OPB; E1FIB; E1OPI). Finally, the products are sent to the warehouse, where they are received, checked and labeled, thus being available for distribution (E1RQB; E1OPB; ATA3).

After product nationalization, three different distribution channels carry out the marketing strategy in Brazil:

- non-exclusive distributors;
- direct sales, in which the company serves hospitals directly; and
- commercial agents, who sell to hospitals (E1VEB; E1CEI; E1VPI).

In the first channel, the Brazilian subsidiary makes the products available to distributors, who resell them to hospitals; in the second, sales take place without intermediaries, with the company's own sales force and distribution logistics; and, in the third, the logistics are on the subsidiary, but the sales force is commissioned (E1VEB; E1CEI; E1VPI; E1OPI; SEM2). [Figure 3](#) shows the whole distribution chain, from China to end-patients, including the roles and responsibilities of each link of the chain.

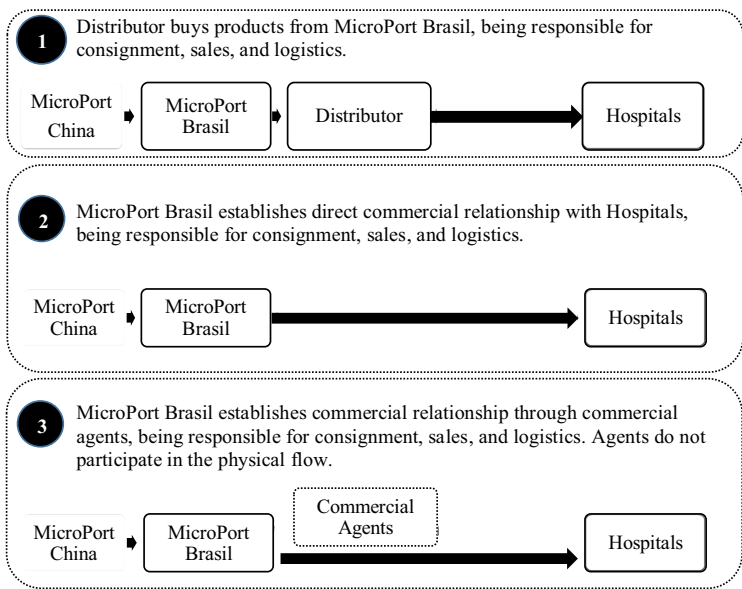


Figure 3.
Interaction between
the links of the
supply chain, from
China to the patients

Source: Based on primary data from interviews with top headquarters' executives and local managers of the Brazilian operation, as well as secondary data obtained from minutes of meetings, reports and summaries of corporate presentations

Discussion

MicroPort's internationalization history shows that taking advantage of new technology in highly internationalized environments favors the insertion, as [Mikhailova and Olsen \(2016\)](#) observed. For example, in five years, the Firehawk product had achieved registration in 40 countries ([MicroPort, 2020](#)).

This study confirms [Johansson and Vahlne \(1977, 2009\)](#). Therefore, the internationalization of medical technology (E1CE1; E1VP1) can expand according to the Uppsala model, assuming that this process depends on the company's learning capabilities and the constitution of a network.

As for Firehawk's strategy of commercial insertion outside China, we can consider Vahlne's thesis (2020) that the Uppsala model does not explain internationalization but rather its evolution. Step 1 of the model assumes occasional and irregular exports – which occur in the first movements (E1CE1; E1VP1; E1RA1). In Step 2, the expansion process takes place through the transfer of ownership, in this case, the registration of products, to exclusive distributors. [Hånell et al. \(2018\)](#) mention this as a practice in EMNCs. In our case, we can make a comparison between the evolution of MicroPort's internationalization and the Uppsala model stages ([Table 1](#)):

From our observations (SEM1; SEM2; SHG), we found that the dynamics of MicroPort's internationalization model differs regionally, as confirmed by the corporation's international leadership (E1CE1; E1VP1). In the case of Brazil, there was an evolution to Stage 3, which consists of setting up its own subsidiary (ATA2; ATA3; CONF2).

Table 1.

Comparison between
stages: Uppsala
model and MicroPort

Stage	Uppsala model	MicroPort
1	No regular export activities Occasional deliveries	Identified a distributor to lead and hold the registrations After registration, the first samples were sent for experimentation by opinion formers in the countries
2	A representative in the host country matters Relationship with customers, sales, and distribution	Sought to develop a strong base for distribution Fostered participation in biddings
3	Own subsidiary in the country Relationship with customers, sales and distribution	Established sales office without direct exports but regaining ownership of the records. Authorized imports from distributors, now non-exclusive Created a local subsidiary and became the holder of records; imports with exclusivity

Source: Based on primary data from interviews with top headquarters' executives and local managers of the Brazilian operation, as well as secondary data obtained from minutes of meetings, reports and summaries of corporate presentations

MicroPort's movement in a market like Brazil suggests that cultural and behavioral issues (Vahlne, 2020) strengthen that medical device market development depends on local perspectives and values. In other words, the subsidiary must have greater autonomy in the local operation by using a team of local managers that handle institutional specificities better.

In MicroPort's operation in Brazil, we observed the formation of an ecosystem in the local market for internationalization, as proposed by Hult, Gonzalez-Perez and Lagerström (2020); interviews (E1CEI; E1VPI) and global corporate presentations (SHG; CONF1; CONF2) confirmed it. This ecosystem develops through the network of local relationships, such as commercial agents and distributors.

A managerial implication of the present study is that MicroPort's experience and application of the Uppsala model to international expansion can serve as an essential learning experience for Brazilian multinational companies. MicroPort, like most Brazilian companies with global visibility, is an EMNC that faces challenges in the internationalization process (Nolke, 2014). Unfortunately, studies related to the rise of EMNCs and the application of the Uppsala model are rare (Meyer & Thaijongrak, 2013). However, Elango and Pattnaik (2011) show that knowledge, gradual learning and network relationships, which are fundamental assumptions of the Uppsala model, are essential resources to explain these companies' internationalization.

Our study reinforces this assumption by showing the challenge and complexity of a high-tech Chinese company's internationalization to an emerging country (Brazil) in the medical device sector. It also shows the influence of the institutional environment and the importance of local managers. This sector has its own features in a regulatory environment governed by Anvisa. With the experience acquired in the local market and the specificities of the industry, the Chinese company left out Stage 2 to enter Stage 3 of the Uppsala model. This action required transferring the registrations of its products and obtaining the regulatory and fiscal licenses to be able to import and sell in the country.

As the demand for medical devices originates in the patient, seeking a closer relationship between the manufacturer and the final consumer strengthens the concepts of distribution channels, as presented by Machková (2006). The interactions between the chain links are represented by MicroPort's branch in Brazil (E1VEB; E1OPB; CONF2), which supplies hospitals and clinics through direct sales and indirectly through distributors and commercial agents. Getting to the patients at the time and in the amount needed requires orchestrating activities between all the parties involved, which defines the relationship network's success.

Conclusion

The purpose of this article was to understand how an EMNC from a high-tech sector internationalized to a country with significant institutional and cultural differences. To achieve this goal, we addressed MicroPort's case regarding its drug-eluting stent product distribution in Brazil.

The Uppsala model refers to a gradual internationalization involving countries that are culturally closer and later to those more distant. In our case, MicroPort started exporting to Asian countries, such as Japan. Nevertheless, when it decided to enter a distant country (like Brazil), MicroPort used the Uppsala model regarding local learning and the entry stages in the target market, such as the definition of distribution channels.

The study provided essential contributions to the literature. First, it showed that high-tech EMNCs, when internationalizing to other markets, need aggressive strategies. MicroPort has a clear guideline to become a global company. With research and development (R&D) and launching an innovative product (Firehawk), it achieved registration and approval in more than 40 countries in just five years. MicroPort believes that companies' globalization is necessary for business development efforts in the medical field (Mikhailova & Olsen, 2016).

Second, it confirms the need to adopt different strategies for supply chain operations, according to the specificities of the markets where firms operate. Lee (2018) stress that the medical device distribution model is not simple and requires the technology holder to expand its control and influence over all actors in the new market chain. For example, in Brazil, the medical device distribution structure takes several forms.

Third, it adds essential contributions to the Uppsala model, concerning the processes of going through stages, learning and building a network relationship. Our findings are similar to the process described as a sequence of distinct phases of activities (Evers, Andersson, & Hannibal, 2012) and resembles Mikhailova and Olsen's (2016) results.

In the case of Brazil, moving from Step 2 to Step 3 of the Uppsala model required, among the first actions of MicroPort, hiring experienced Brazilian professionals to handle institutional issues related to government bodies (such as Anvisa, Internal Revenue Service) and access public notices to compete in biddings. Thus, we present here the first insight from this study: **I-1: The formation of a local top management team is essential to deal with institutional issues of government bodies when an EMNC internationalizes to a culturally distant market.**

As far as learning is concerned, MicroPort has gone and is still going through a learning process in Brazil. Nevertheless, the findings showed that the company's culture of respecting regionalism without imposing its headquarters' management model accelerated the internationalization process in Brazil. Hence, we have a second insight from this study: **I-2: When there are significant institutional differences between the home country and the host country, autonomy in managing the foreign subsidiary positively affects the acceleration of the internationalization process of companies in the high tech sector.**

Concerning the network of relationships, a relevant finding for the Uppsala model is that MicroPort's building emerged from sales representatives rather than a direct approach to customers. This caused the brand to be introduced in the market not because of the reputation of the manufacturing country but because well-known representatives were offering its products. The company sought to sponsor agents with established networks with hospitals, and approach them gradually, which enabled a less imposing kind of learning. Therefore, we present a third insight of this study: **I-3:** *When there are significant institutional differences between the home country and the host country, the use of local relationship networks positively affects the acceleration of the internationalization process of companies in a high-tech sector.*

The study findings show that MicroPort, despite being from a country with a culture and habits quite different from Brazil, respected Brazilian cultural issues, avoiding potential and expected cultural shock. In 2021, as part of its growth strategy in the country, the subsidiary hired an experienced Brazilian female executive to be the general manager of local operations (Medicina S/A, 2021) to get closer to opinion-making doctors, thus achieving greater exhibition of its innovative product, the Firehawk. Additionally, actions in the media (BandNews, 2021) and participation in regional conferences, such as the one organized by the Latin American Society of Interventional Cardiology (MicroPort Brasil, 2021), are also the first step toward a more direct relationship with doctors.

We acknowledge the limitations of this study, which suggest future research. First, we carried out the empirical analysis with a single company. Although the results may be used as lessons learned from applying the Uppsala model to the international expansion of an EMNC in an emerging market, caution is necessary for generalizing our findings. Future studies should carry out comparative cases, considering other emerging multinational companies from the same sector or different industries investing in other emerging markets. Second, there is a limitation that the case studied did not explore the concepts of the later stages of the Uppsala model. We suggest further studies with companies that decided to produce in the host country after completing the first steps. Finally, despite collecting relevant information, we did not have access to more concrete data on the level of investment made in Brazil during the internationalization process. These are the company's strategic data that will be hardly available, even for future studies.

Regardless of these limitations, the study provided an intriguing case of a Chinese company's internationalization to Brazil, operating in a high-tech medical sector. The challenges for EMNCs' internationalization continue, which makes more research in this area timely. However, our findings can be the first step.

References

- ABBOTT. (2020). 2019 Annual report. Retrieved from: www.abbottinvestor.com/static-files/8829af8d-783a-42ef-9566-37a699e79188
- ANVISA. (2018). Relatório de definição e análise do problema regulatório? Contribuições Para a revisão normativa da RDC nº185/2006. Retrieved from: www.gov.br/anvisa/pt-br/assuntos/produtosparasaude/temas-em-destaque/arquivos/7263json-file-1
- BandNews. (2021). Jornal BandNews TV 2ª Edição – Mirângela machado, diretora geral da MicroPort fala sobre novo stent. Retrieved from: www.youtube.com/watch?v=hedhTLvr5iw
- Boston Healthcare. (2020). Analysis of China's first national tender on coronary stents. Retrieved from: www.bostonhealthcare.com/analysis-of-chinas-first-national-tender-on-coronary-stents/

- Boston Scientific. (2020). 2019 Annual report. Retrieved from: Retrieved from: www.bostonscientific.com/content/dam/bostonscientific/corporate/annual-report/2019_Boston_Scientific_Annual_Report.pdf
- Boyen, M.H., & Ogasavara, M.H. (2013). Internationalization patterns of multinational lodging firms in Brazil. *Tourism and Hospitality Research*, 13(4), 181–200. Retrieved from: doi: <https://doi.org/10.1177/1467358414525623>.
- Buchanan, D., & Bryman, A. (2009). Studying processes in and around organizations. *The SAGE handbook of organizational research methods*, London: Sage Publishing.
- Buckley, P. (2019). China goes global: provenance, projection, performance and policy. *International Journal of Emerging Markets*, 14(1), 1–20. Retrieved from doi: <https://doi.org/10.1108/IJoEM-01-2017-0006>.
- Coughlan, A.T., Anderson, E., Stern, L.W., & El-Ansary, A.I. (2012). *Canais de marketing e distribuição*, São Paulo: Pearson.
- Cransac-Miet, A., Zeller, M., Chagué, F., Faure, A.S., Bichat, F., Danchin, N., . . . Cottin, Y. (2021). Impact of COVID-19 lockdown on lifestyle adherence in stay-at-home patients with chronic coronary syndromes: towards a time-bomb. *International Journal of Cardiology*, 323, 285–287. Retrieved from: doi: <https://doi.org/10.1016/j.ijcard.2020.08.094>.
- Dalenberg, D. (2020). International medical device marketing. *International Journal of Health and Economic Development*, 6(1), 15–26.
- Dow, D., Liesch, P., & Welch, L. (2017). Inertia and managerial intentionality: Extending the Uppsala model. *Management International Review*, 58(3), 465–493. Retrieved from: doi: <https://doi.org/10.1007/s11575-017-0340-0>.
- Eisenhardt, K.M. (1989). Building theories from case study research. *The Academy of Management Review*, 14(4), 532–550. Retrieved from: doi: <https://doi.org/10.5465/amr.1989.4308385>.
- Eisenhardt, K.M., & Graebner, M. (2007). Theory building from cases: Opportunities and challenges academy of. *Academy of Management Journal*, 50(1), 25–32. Retrieved from: doi: <https://doi.org/10.5465/amj.2007.24160888>.
- Elango, B., & Pattnaik, C. (2011). Learning before making the big leap: Acquisition strategies of emerging market firms. *Management International Review*, 51(4), 451–481. Retrieved from: doi: <https://doi.org/10.1007/s11575-011-0085-0>.
- Euromonitor International. (2018). *Top countries to drive medical device manufacturing report*, Euromonitor International.
- Evers, N., Andersson, S., & Hannibal, M. (2012). Stakeholders and marketing capabilities in international new ventures: Evidence from Ireland, Sweden and Denmark. *Journal of International Marketing*, 20(4), 46–71. Retrieved from: doi: <https://doi.org/10.1509%2Fjim.12.0077>
- Figueira-de-Lemos, F., Johanson, J., & Vahlne, J.-E. (2011). Risk management in the internationalization process of the firm: A note on the Uppsala model. *Journal of World Business*, 46(2), 143–153. Retrieved from: <https://doi.org/10.1016/j.jwb.2010.05.008>.
- Fornes, G., & Butt-Philip, A. (2014). Chinese outward investments to emerging markets: Evidence from Latin America. *European Business Review*, 26(6), 494–513. Retrieved from: doi: <https://doi.org/10.1108/EBR-03-2013-0059>.
- Global Data. (2014). *Coronary stents: Global analysis and market forecasts*, GlobalData.
- Hånell, S.M., Nordman, E.R., Tolstoy, D. & Sharma, D.D. (2018). Pursuing Innovation: An Investigation of the Foreign Business Relationships of Swedish SMEs*. *British Journal of Management*. doi: <https://doi.org/10.1111/1467-8551.12315>.
- Hult, G.T.M., Gonzalez-Perez, M.A., & Lagerström, K. (2020). The theoretical evolution and use of the Uppsala model of internationalization in the international business ecosystem. *Journal of International Business Studies*, 51(1), 38–49. Retrieved from: doi: <https://doi.org/10.1057/s41267-019-00293-x>.

- 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), 101662. Retrieved from: <https://doi.org/10.1016/j.ibusrev.2019.101662>. doi: <https://doi.org/10.1016/j.ibusrev.2019.101662>.
- Johansson, J., & Vahlne, J.-E. (1977). The internationalization process of the firm: A model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, 8(1), 23–32. Retrieved from: doi: <https://doi.org/10.1057/palgrave.jibs.8490676>.
- Johanson, J., & Vahlne, J.-E. (2009). The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership. *Journal of International Business Studies*, 40(9), 1411–1431. Retrieved from: doi: <https://doi.org/10.1057/jibs.2009.24>.
- Khan, Z., Lew, Y.K., & Rao-Nicholson, R. (2020). The role of dynamic capabilities in global strategy of emerging economies' multinationals. *International Studies of Management & Organization*, 50(1), 1–4. Retrieved from: doi: <https://doi.org/10.1080/00208825.2019.1703375>.
- Knight, G.A., & Cavusgil, S.T. (2004). Innovation, organizational capabilities, and the born-global firm. *Journal of International Business Studies*, 35(2), 124–141. Retrieved from: doi: <https://doi.org/10.1057/palgrave.jibs.8400071>.
- Kotler, P., & Keller, K.L. (2015). *Marketing management*, New York, NY: Pearson/Prentice Hall.
- KPMG. (2018). *Medical devices 2030*, KPMG International Cooperative.
- Lansky, A., Wijns, W., Xu, B., Kelbæk, H., Van Royen, N., Zheng, M., et al. (2018). Targeted therapy with a localised abluminal groove, low-dose sirolimus-eluting, biodegradable polymer coronary stent (TARGET all comers): A multicentre, open-label, randomised non-inferiority trial. *The Lancet*, 392(10153), 1117–1126. Retrieved from: doi: [https://doi.org/10.1016/S0140-6736\(18\)31649-0](https://doi.org/10.1016/S0140-6736(18)31649-0).
- Laurell, H., Achtenhagen, L., & Andersson, S. (2017). The changing role of network ties and critical capabilities in an international new venture's early development. *International Entrepreneurship and Management Journal*, 13(1), 113–140. Retrieved from: doi: <https://doi.org/10.1007/s11365-016-0398-3>.
- Lee, M. (2018). Strategies for promoting the medical device industry in Korea: An analytical hierarchy process analysis. *International Journal of Environmental Research and Public Health*, 15(12), 2659. Retrieved from: doi: <https://doi.org/10.3390/ijerph15122659>.
- Lopez, L.E., Kundu, S.K., & Ciravegna, L. (2009). Born global or born regional? Evidence from an exploratory study in the Costa Rican software industry. *Journal of International Business Studies*, 40(7), 1228–1238. Retrieved from: doi: <https://doi.org/10.1057/jibs.2008.69>.
- Machková, H. (2006). *Mezinárodní marketing*, Prague: Grada Publishing House.
- Mariotto, F.L., Zanni, P.P., & Moraes, G. H. S. M. (2014). What is the use of a single-case study in management research? *RAE. Revista de Administração de Empresas*, 54(4), 358–369. Retrieved from: doi: <https://doi.org/10.1590/S0034-759020140402>.
- Medicina S/A. (2021). Mirangela machado assume diretoria geral da MicroPort brasil. Retrieved from: <https://medicinasa.com.br/mirangela-machado-microport/>
- Medtronic. (2020). 2018 Annual report. Retrieved from: <https://investorrelations.medtronic.com/static-files/da4767cb-a6c9-4716-801e-48a0a3155e1f>
- Meyer, K.E., & Thaijongrak, O. (2013). The dynamics of emerging economy MNEs: How the internationalization process model can guide future research. *Asia Pacific Journal of Management*, 30(4), 1125–1153. Retrieved from: <https://doi.org/10.1007/s10490-012-9313-9> doi: <https://doi.org/10.1007/s10490-012-9313-9>.
- MicroPort. (2018). 2017 Annual report. Retrieved from: www.microport.com/assets/financial-reports/reports/en/2017-annual-en.pdf
- MicroPort. (2020). MicroPort news. Retrieved from: www.microport.com/en/news/first-implant-of-firehawk-stent-successfully-completed-in-oman

- MicroPort Brasil. (2021). Solaci 2021. Retrieved from: www.linkedin.com/posts/microportbrasil_solacicaci2021-solaci-solacicaci-activity-6829570082692247552-q-fr
- Mikhailova, O., & Olsen, P.I. (2016). Internationalization of an academic invention through successive science-business networks: The case of TAVI. *Journal of International Entrepreneurship*, 14(3), 441–471. Retrieved from: <https://doi.org/10.1007/s10843-016-0186-8>.
- Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis: an expanded sourcebook*, Sage Publishing.
- Nolke, A. (2014). *Multinational corporations from emerging markets*, Hampshire: Palgrave-Macmillan.
- Pettigrew, A.M. (1997). What is a processual analysis? *Scandinavian Journal of Management*, 13(4), 337–348. Retrieved from: [https://doi.org/10.1016/S0956-5221\(97\)00020-1](https://doi.org/10.1016/S0956-5221(97)00020-1).
- Rolnicki, K. (1998). *Managing channels of distribution: the marketing executive's complete guide*, New York, NY: Amacom.
- Sutherland, D., Hennart, J.-F., & Anderson, J.R. (2019). How does the routing of FDI to and via tax havens confound our understanding of Chinese MNE identity? A critical review of the empirical literature on Chinese MNEs. *Asian Business & Management*, 18(5), 337–359. Retrieved from: <https://doi.org/10.1057/s41291-019-00058-2>.
- Thøgersen, J., Barcellos, M.D., Perin, M.G., & Zhou, Y. (2015). Consumer buying motives and attitudes towards organic food in two emerging markets: China and Brazil. *International Marketing Review*, 32(3/4), 389–413. Retrieved from: <https://doi.org/10.1108/IMR-06-2013-0123>.
- Vahlne, J.-E. (2020). Development of the Uppsala model of internationalization process: From internationalization to evolution. *Global Strategy Journal*, 10(2), 239–250. Retrieved from: <https://doi.org/10.1002/gsj.1375>.
- Vahlne, J.-E., Ivarsson, I. & Johanson, J. (2012). Overcoming the liability of outsidership – The challenge of HQ of the global firms. *Journal of International Management*, 18(2012), 224–232.
- Yin, R. (2006). *Case study research: Design and methods*, CA: Sage Publishing.
- Zelkha, S. (2012). Benchmarking of a medical device company's product development process. Thesis Science Magister, Massachusetts Institute of Technology, Cambridge.

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