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Article

Determinants of Internationalization as Levers for Sustainability: A Study of the Portuguese Pharmaceutical Sector

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Abstract: Pharmaceutical industry faces the pressure of a global economy, the loss of value in local markets and the highly innovative intensity that characterizes the sector. With this investigation, we intend to carry out the first characterization of the Portuguese pharmaceutical industry. This study aims to identify the determinants of internationalization as levers of sustainability and to establish a pattern that corresponds to better outcomes in pharmaceutical companies' internationalization ventures. All companies from the Portuguese pharmaceutical export sector, a total of 16 companies, were contacted. Data was collected from a highly representative sample corresponding to 63% of the total. A previous contextualization of the pharmaceutical sector and a bibliographic review were carried out, creating the basics of the empirical framework, a quantitative research. This study revealed a deeply internationalized sector, but the overall results are conditioned by some weaknesses, namely the lack of sustainable competitive advantages, a limitation in companies' resources to compete in a global environment and the reduced innovation in the object of internationalization. It was also observed the reduced institutional support to export ventures. This sector is considered strategic given the high contribution to country's exports. The conclusions of this study may have important implications for Portuguese pharmaceutical industry, to institutional organizations supporting the sector and to the academic environment.

Keywords: pharmaceutical industry; internationalization determinants; internationalization strategy; levers for sustainability

1. Introduction

World trade has evolved considerably since the Second World War, especially in the last fifteen years. We are facing an increasing breakdown of trade barriers, harmonization of trade rules and an increasing globalization of markets. In parallel, the great development of communication technologies has developed conditions to companies, regardless of their size and sector of activity, to seek customers and develop business in countries and markets, where access was very complicated until recently, or it implied truly unbearable installation costs, especially for resource-constrained companies [1]. Companies, who until recently benefit from comfortable positions in local markets, today can see those positions truly threatened by global competition [2]. This is the global context where we+ frame the Portuguese pharmaceutical industry (PPI), whose sustainability is currently in risk because this sector characterized by a very high competitiveness in innovation and resources [3]. In this specific sector, internationalization emerges as a lever for economic and business sustainability.

In order to understand this phenomenon, we carried out a literature review to identify and characterize the most significant studies that sought to explain the internationalization of the pharmaceutical industry (PI). This review led us to isolate the

research problem and to express the following research question: What are the determining factors in the internationalization of PPI? We have also identified the following secondary questions, to carry out a complete characterization of the phenomenon of the internationalization of PPI: What criteria do PPI follow in defining the international strategy? What are the competitive advantages of PPI? How PPI became internationalized? What are the reasons that lead them to internationalize their operations? What difficulties do they face in managing the internationalization process?

The exporting PPI front the imperative of international expansion as a lever for sustainability, but also with the challenge of high competitiveness and complexity that characterize the pharmaceutical market on a global scale. This study intends to be a small contribution to increase the knowledge about the internationalization processes of this sector, framed in an economy of limited resources when compared to the global environment. At an operational level, it is expected the identification of strategic orientations, factors and patterns in internationalization attitudes, as well as possible associations with greater intensity and results in internationalization.

2. Background

Pharmaceutical Industry

In our days, PI has an undeniable role in improving the quality of life of populations [4]. This role is expressed by objective indicators such as increased life expectancy and improved quality of life in patients affected by numerous pathologies (oncology, AIDS, cardiovascular, the current pandemic situation, among others) or even by the impact of some drugs on global economic indicators. In the last century, the life expectancy of the European population has increased by about thirty years, due to the remarkable advances in the investigation of new drugs, now accessible to the general population, which make it possible to eliminate pathologies that were earlier responsible for high rates of mortality and morbidity [3,5]. From an economic point of view, PI is a strategic sector [3].

Financial results tend to be proportional to the degree of investment in technology and marketing [6]. Activities with less technological complexity (manufacturing of raw materials, intermediate products and products with small or none differentiation) are associated with lower financial margins. For this reason, PI tends to develop new innovative drugs, associated with much better margins, especially in the period of exclusivity, as result of the innovation patents associated with them [7]. However, the development of a new drug is a very expensive and time-consuming process. It often involves investments bigger than one billion euros [8] and long development times, bigger than twelve years, from the identification phase of new pharmaceutical identities to the beginning of effective marketing. In the last twenty–five years, research and development (R&D) costs have tripled in Europe and multiplied by six in the United States [3].

The World pharmaceutical market moved approximately 1.050 billion euros (see table 1). North America (United States and Canada) holds about 45%, Europe 23%, China 10%, Japan 7% and the rest of the World only 11% [9].

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Table 1. World Pharmaceutical Market.

	2018		2019			2020		
euros +000.000	Sales	M.S.%	Sales	M.S.%	+/- %	Sales	M.S.%	+/- %
North America	433.262	45%	457.197	44%	6%	478.676	45%	5%
Europe	215.882	22%	229.876	22%	6%	240.379	23%	5%
China	105.859	11%	115.607	11%	9%	103.408	10%	-11%
Japan	72.429	7%	73.973	7%	2%	72.732	7%	-2%
Latin America	36.140	4%	39.130	4%	8%	44.001	4%	12%
Rest of World	105.932	11%	114.415	11%	8%	118.527	11%	4%
World	969.504	100%	1.030.199	100%	6%	1.057.723	100%	3%

The pharmaceutical market is deeply concentrated in the most developed regions. It has grown by 9% over the past three years.

The Internationalization of Pharmaceutical Companies

The internationalization of companies has been the subject of intense investigation in the last 70 years, since the publication of Penrose's seminal research in 1959 [10], with the definition of several theories that explain this phenomenon from different perspectives. First frameworks explained the internationalization and the foreign direct investment of American multinational companies after the II World War [11]. Considering specifically the PI sector, the number of papers that intends to study internationalization is small and not uniform concerning the methodologies adopted in each one of them. Table 2 presents a resume of the most representative studies that intend to explain the internationalization process in Pharmaceutical Industry.

Table 2. Studies on the internationalization of pharmaceutical companies.

Reference	Study Type	Study Object	Sample (companies)
Fina & Rugman (1996) [12]	Empirical	Internationalization Strategies	1
Buckley & Chapman (1997) [11]	Empirical	Internationalization Strategies	8 pharmaceutical 2 medical devices
Javalgi & Wright (2003) [13]	Conceptual	Entry Mode	
Chittoor & Sougata (2007) [14]	Empirical	Internationalization Strategies to emerging markets	40
Kuntluru et al. (2012) [15]	Empirical	Internationalization Strategies, foreign companies	103
Wrona & Trapczynski (2012) [7]	Empirical	Internationalization Strategies to emerging markets	5
Chitour (2013) [16]	Conceptual	Entry Mode	

 doi:10.20944/preprints202107.0088.v1

Mowla et al. (2014) [17]	Empirical	Internationalization Strategies	1
Campins (2015) [18]	Empirical	Internationalization Strategies	2
Barbosa et al. (2016) [19]	Empirical	Internationalization Strategies	163
Diaz et al. (2017) [20]	Empirical	Internationalization Strategies	1
Pereira & Gomes (2017) [21]	Empirical	Internationalization Strategies	4
Rentala et al. (2017) [22]	Empirical	Export performance	23 pharmaceutical 17 automobile sector
Teramae et al. (2020) [23]	Empirical	Internationalization Strategies	30

In general, we observed a high dispersion of criteria, methodologies and objectives. In previous works, other authors have faced the same problem [7]. The most frequent theoretical frameworks are the internationalization model based on resources and capabilities [24], the incremental internationalization [25] and the eclectic paradigm [26]. This choices reflects researchers' concerns in evaluating companies' use of internal resources and capacities to create conditions for international expansion and, simultaneously, pointing the trend to an incremental internationalization, from sporadic exports to the establishment of manufacturing facilities in foreign markets [27]. A set of attributes or determinants in the internationalization process were identified as well: entry modes (EM), internationalization barriers (IB) and motivations (IM), the psychic distance (PD) and competitive advantages (CA) [7,11,12,14,15,19,22].

Previous frameworks focused on the analysis of internationalization processes but did not analyze internationalization as a source of sustainability for companies. None of the frameworks intended to study the sustainability of PI as a capital-intensive sector, highly demanding of resources, crucial in each Country's economic context.

The Portuguese Pharmaceutical Industry

In 2020, at ex-factory prices, the Portuguese pharmaceutical market values approximately 3.95 billion euros, 1.6% of European market value and only 0.4% of the World Market [9]. In a global context, the Portuguese's pharmaceutical market has a small size, consisting mainly of small and medium-sized companies (see table 3) [28].

Table 3. Portuguese's pharmaceutical Companies by number of employees.

	Nº Companies	%
< 10 employees	90	64%
10-49 employees	20	14%
50-249 employees	24	17%
> 250 employees	7	5%

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The sector underwent a strong readjustment from 2011 to 2015, due to the European Unions' assistance program for the Portuguese economy. This program had a strong impact in the pharmaceutical sector, with a loss of circa 21% of its value in just 4 years. Recently we observed a very slow recovery, although the potential is still far from the values before 2011. Investment in innovation has a slight tendency to increase although very small and of no significance when compared to the other European countries, in particular with similar economies: Austria, Cyprus, Slovenia, Spain, Finland, Hungary, Ireland, Poland and Romania, all with R&D investment levels much higher than Portugal [3,29]. This reality configures a situation of relative weakness, especially those companies that still have the local market as the main source of income. PPI's international activity has grown since 2011. In recent years, PPI's export intensity (percentage of products sold abroad) has more than doubled compared to the values before 2010, suggesting that PPI sought in foreign markets to overcome the loss of income in the local market, which has retracted. Likewise, the level of coverage of imports by exports in the pharmaceutical sector has doubled in recent years. This phenomenon was significantly more evident in the pharmaceutical sector than in other industrial sectors. However, the penetration rate of imports in the domestic market (percentage of supply in the Portuguese market imported from abroad) is significantly higher than the national economy average and has worsened in recent years (see Table 4) [30].

Table 4. Export Economic Indicators for Portuguese Pharmaceutical Industry.

Mean yearly value%		2008 - 2010	2011 - 2013	2014 - 2016
Export Intensity(1)	Portugal	14.0	17.9	19.5
	Only PPI	42.8	62.5	85.7
Coverage rate of imports	Portugal	70.9	87.8	90.3
by exports(2)	Only PPI	22.9	31.6	40.6
Import penetration rate	Portugal	18.7	19.9	21.1
on the domestic market(3)	Only PPI	76.5	84.1	93.7

1- How much of the local production is exported. **2**- What percentage of imports is offset by exports. **3**- How much of the local supply is imported.

The history of PPI's internationalization is relatively recent. It was powered by domestic markets' retraction. In 2017, PPI's exports reached around one billion euros, about 2% of the country's total exports [28,31]. Despite the high growth in exports in recent years, Portuguese pharmaceutical products' trade balance is strongly negative, -1.489 million euros in 2017 [31], conditioning the sustainability of the pharmaceutical sector and resulting in the motivational basis of this study.

3. Theoretical Framework

The internationalization of the PI has been framed by scholars in the currents of thought whose key points are presented in table 5 [7,11–23]. The understanding of companies' internationalization phenomena has undergone an enormous evolution since the 1960s. The first theories, predominates the approaches based on the economic perspective, influenced by the post-World War II environment and by the strong internationalization movement of the American productive industry [32]. Shows the importance of acquiring resources for the manufacturing of goods and services to create profit. There is particular evidence on the need for experienced human resources that promote the appropriate use of available resources [10,33,]. The organization's resources are at the basis of the development of sustainable competitive advantages when they are rare and inimitable [24]. In 1975 Williamson [34] developed another model, which focuses

 doi:10.20944/preprints202107.0088.v1

on transaction costs. According to the same, the organization tends to outsource activities to other markets and/or entities until the cost of a new transaction within the company is equal to or less than the cost of carrying out the same transaction to an external market. According to this model, cost minimization explains structural decisions. The company internalizes and vertically integrates operations to reduce transaction costs. This model tries to explain why companies decide to establish themselves in an external market, with a service or manufacture structure, instead of licensing production or contracting a local distributor or agent [2,35]. In the later 1970s, new behavioral approaches emerged. The explanation of the development of international activity is supported by models of incremental internationalization, from sporadic exports to the establishment of manufacturing units in the target markets [25]. Eclectic models also emerge, relating the transaction costs (internal advantages), company's relationships with the markets (competitive advantages) with macroeconomic elements of international production (product life cycle models, local competitive advantages) [26]. According to this model, the company decides to invest directly in an external market if there are three key advantages: ownership, location and internalization. If the contractual risks are high, the company prefers to exploit its property advantages (internalization) through direct investment instead of selling or licensing the business to external partners [35].

Later on, a new perspective emerges, highlighting the significance of professional networking in internationalization decisions [36]. Professional networking is a way of managing interdependencies between different actors in a professional activity. While in models focused on the market, interdependencies are regulated by price mechanisms, according to this model, actors are interconnected through exchange relations. Their needs and capacities are mediated through interactions between them [37]. We thus observe a clear change in the business rationality, from the classic model of transactions based on power to a model based on relations of multipolar cooperation.

Table 5. Key aspects of the Internationalization Models.

Line of though	Reference	Theory	Key-points
Economic Models	Penrose, 1959[10] Barney, 1991[1]	Resources and capabilities	Internal resources, capabilities and productive services, companies' CA
	Williamson, 1975[34]	Transaction costs	Competitive markets, transaction-costs minimization, scale economies, international vertical integration
	Dunning, 1977, 2001[26]	Eclectic Paradigm	Ownership, location and internalization advantages as a leveler for internationalization
Behavioral Models	Johanson & Vahlne, 1977[25]	Uppsala model	Incremental internationalization, psychological distance
	Johanson & Mattson, 1988[36]	Networking model	Knowledge and commitment, professional networking

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Despite the high number of theories and experimental models, there is not still a model that globally explains internationalization and, above all, allows transposition of theoretical models' conclusions to the operational reality of organizations in their strategic decisions. For this reason, several authors support the need for a new holistic approach, transversally accepted, more integrative, which considers the various factors found in the daily reality of companies [27,35].

Determinants of Pharmaceutical Industry Internationalization

The study of the internationalization of PI allowed the identification of a set of variables, determinants of the sustainability of internationalization ventures [7,11–23], better explained in the following points.

Internationalization Strategic Orientation

Managers' internationalization strategic orientation (ISO) is essential to the correct understanding of the need to expand company's activity to foreign markets, in allocating the needed resources, in defining the international strategy and, above all, in the way of viewing and identifying opportunities in foreign markets [38]. Companies' internationalization reluctance is a consequence of a reduced determination of top managers [39]. Companies and managers' perception of the extent and depth of internationalization's strategy can affect the construction and success of internationalization's venture [40]. One of the fundamental aspects in the definition of a company's international strategy is the attitude of the top managers because, too often, the supposed "multinational vision" of the companies, in reality, is nothing more than a simple extension of the local market's strategy, applied in external markets [41].

Internationalization Motives

The reasons that influence a company's decision to follow an internationalization strategy are diverse and constitute a set of steps, converging on the final decision. Internationalization motives (IM) are a determinant of a company's international development [42]. Can be classified as proactive (PIM) or reactive (RIM), depending on whether the company initiates internationalization because of an internal and well-developed strategy or, in contrast, reacts to a certain conjuncture of an external fact that has been configured in the market. PIM represent incentives for choosing new strategies, based on the company's benefits in exploring specific competences (for example, a certain exclusive technological advantage) or opportunities identified in the market.

Competitive Advantages in Internationalization

The profitability of companies is proportional to their capability to build and exploit advantages in the markets where they operate [43,44]. Competitive advantages (CA) arise fundamentally from the value that a company can create for customers, which exceeds the cost of the company in creating it. Sustained competitive advantages result from the creation of added-value strategies, totally distinct and inimitable by competing companies [1]. The different sources of competitive advantages, costs (CCA), service (SCA) or product (PCA), reflect a company's ability to apply its resources better than competing companies, in creating value for customers [45,46].

Barriers in the process of Internationalization

In the development of an internationalization process, companies face obstacles and barriers to the development and implementation of the corresponding strategies [47]. The

 doi:10.20944/preprints202107.0088.v1

difficulty in registering new drugs, certain limitations in the granting of reimbursement by governmental entities and the existence of patents are good examples of barriers to the internationalization of pharmaceutical companies [7]. These barriers (IB) affect the company in several ways: discourage non-exporting companies from starting a business in foreign markets, inhibit the export attitude, can induce attitudes of foreign divestment and dissuade ex-exporting companies from resuming internationalization strategies [48]. The experience and the existence of good professional networking in the foreign markets can be important to minimize the consequences of some barriers to internationalization [47] (Kahiya, 2018). From a conceptual point of view, we can divide the barriers into internal (IIB), inherent to the company, regarding the strategic definition and allocation of resources, and external (EIB), related to the market environment and external context [48].

Entry Mode Selection

The choice of the entry mode (EM) is one of the most important strategic decisions in an internationalization process [2]. The EM has a direct impact on the performance of internationalization so that an inappropriate choice can affect the entire strategy and future decisions [49]. The different EM can be grouped according to the need for investment: No investment (WEM): exports, licensing contracts, franchising; With investment (IEM): joint ventures, acquisitions and establishment of subsidiaries [50]. The choice of EM is influenced, among other aspects, by the level of investment, assumed risk, flexibility and degree of control that company intends to have in the target market [2].

Psychic Distance

Psychic Distance (PD) relates to the managers' perception of the barriers and difficulties in communicating and interpreting information from external markets [25,51]. It has often been used as an explanatory factor for the degree of adaptation of marketing strategies, sequences of international investment, the choice of EM and the companies' international performance [52]. Frequently confounded with cultural distance (differences in cultural values between countries), PD is much less objective than cultural distance. It must be analyzed according to the individual interpretation of each manager because it largely depends on the individual sensitivity and perception [53]. The outcomes found in the literature are sometimes controversial and paradoxical [51], being difficult to establish a definitive conclusion about the impact of this variable on the different factors of internationalization. PD seems to be, more than a determinant, a moderator of other factors namely IB (whose perception increases with PD) and EM [52,54].

4. Empirical Analysis

Methodological Options

This study corresponds to a quantitative design, based on the measurement, analysis and interpretation of numerical data [55]. Data collection was carried out through a structured questionnaire (see table 6).

The main aim of our research is to study the sustainability determinants of a capital-intensive economic sector, in a small economy in the global context, as is the case of Portugal. For this reason, only the PPI manufacturers and exporters of pharmaceutical products (raw materials or drugs in finished form) were selected. The selection of companies was carried out using the Iberinform database [56]. We've selected all companies with Portuguese activity classification (CAE) 21100 (manufacture of basic pharmaceutical products) and 21201 (manufacture of medicines). The database selection

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was conducted on 18 September, 2019. We identified 82 companies with these criteria. The sample validation procedure was carried out using the information available on each company's website and with an additional telephone or email contact, when needed, which allowed the identification of companies with effective industrial and international activity. Sixty–six companies were excluded due to being subsidiaries of other companies (34 companies) or because their current activity did not fall within the scope of our research (32 companies). Thus, the final universe is composed of 16 companies that meet the criteria eligible for this study: pharmaceutical company, producer and exporter of pharmaceutical products, having Portugal as the center of international strategy's decisions.

Questionnaire and Scales

The option for retrieving each variable's information and collecting the needed quantitative data was the creation of a questionnaire [57] using scales previously validated in the scientific literature [58] and better described in the table 6. The questionnaire was built on the Google Forms platform [59].

Table 6. Variables, dimensions and type of scale used.

Variable	Dimension	Items	Comments	Scale
Internationalization Strategic Orientation (ISO) [60,61]		1	If managers have an effective "international mindset" or if they just replicate the "local strategy" in international markets	Nominal, two point
Entry Mode (EM) [62]		1	Modes of entry into foreign markets: no direct financial investment (export and licensing) or direct financial investment (Joint ventures, direct investment)	Nominal, two point
Psychic Distance (PD) [60]		1	If "psychic distance" is a conditioning and/or moderating factor in internationalization	Ordinal, seven-point Likert
Competitive Advantages (CA) [45,63]	**Cost** (CCA)	2	Capture the different competitive advantages and their relevance in international activity	Ordinal, seven-point Likert
	Service (SCA)	5		
	Product (PCA)	3		
Internationalization Motives (IM) [48]	**Reactive** (RIM)	4	Identifies the main reasons to internationalize and whether the reasons are of a "proactive" or "reactive" nature	Ordinal, seven-point Likert
	Proactive (PIM)	6		
Internationalization Barriers (IB) [60]	**Internal** (IIB)	6	Captures the main barriers to internationalization and whether these are internal or external to the company	Ordinal, seven-point Likert
	External (EIB)	6		
Years of International Activity [45, 62]		1	Years of International activity	Ordinal, seven point
Countries with Intern. Activity [45, 62]		1	Number of Countries with international activity	Ordinal, seven point

Yearly Turnover [64]	1	Yearly turnover	Ordinal, seven point
% Turnover international business [45,64]	1	Percentage of total turnover from international business	Ordinal, seven point
Total number Employee [64]	1	Total number of employee	Ordinal, seven point
% Employee international business [45,62]	1	Percentage of total employee allocated to international business	Ordinal, seven point
% Turnover to R&D [14]	1	What percentage of total turnover is allocated to R&D activities	Ordinal, seven point
Main International Activity	1	Main internationalization object: innovative products or commodities/others.	Nominal, two point

Reliability and Internal Consistency

As previously mentioned, the scales used in our survey were previously validated in the scientific literature. However, we decided to perform a reliability analysis of our questionnaire in order to confirm its internal consistency, using the Cronbach's alpha calculation (see Table 7) [65].

Table 7. Questionnaire's Internal Consistency.

Dimensions	Mean	SD	Items	α	Internal Consistency [66]
PD	2.6	1.58	1	- - -	
CCA	4.20	0.92	2	0.974	Very good
SCA	4.50	0.85	5	0.817	Good
PCA	3.90	0.74	3	0.748	Reasonable
RIM	4.50	1.27	4	0.653	Weak
PIM	6.10	0.88	6	0.823	good
IIB	4.10	1.10	6	0.795	Reasonable
EIB	4.80	0.79	6	0.710	Reasonable
Global	-	-	33	0.691	Reasonable

Cronbach alpha's values obtained on the RIM scale was $\alpha = 0.653$, considered weak. So we have decided to submit this scale to a complementary consistency test [65] with which its internal consistency was confirmed. We found that no item, being eliminated, would significantly improve the reliability of the scales. The complete questionnaire has a reasonable $\alpha = 0.691$ and thus, enough internal consistency to be analyzed and interpreted.

 doi:10.20944/preprints202107.0088.v1

Universe of Research and Sampling Process

The target population of this investigation is composed of 16 companies. In the presence of small universes, it is recommended to survey the entire universe [67]. Having followed this procedure and despite having made several inquiries with the respondents, due to the limitations resulting from the current pandemic situation, we obtained a total of 10 responses representing 63% of the universe of this study, a significant value. Once we haven't surveyed the entire Universe, we decided to submit our sample to an additional test: an analysis of representativeness [65]. We have selected three variables and nine stratification items, based on data referenced in the literature on PI. Our sample obtained high levels of representativeness in all nine items, regardless of the stratification variable used. It is important to remember that the object of this investigation is a very specific sector of a country. All studies carried out in pharmaceutical companies' internationalization, presents very small samples (see table 2). Considering Saunders [58], but following the carefulness suggested by Kruskal and Mosteller [68] about the use of the word "representativeness", considering that our sample has a high homogeneity and is highly representative of the universe of studied companies, it seems to be appropriate to consider that the sample analyzed is representative of the studied sector. A pre-test was carried out, with the realization of two surveys in person. This procedure allowed us to validate the correct perception and confirm that each question was correctly understood, allowing us to capture the desired perception in the original scales. The top managers from each company (members of the Board of Directors, General Managers, and International Senior Managers) were contacted between 1 December, 2019 and 31 March, 2020, and invited to participate in this research.

Descriptive Analysis

The table 8 presents the summary the most relevant parameters of the descriptive analysis to all variables and respective dimensions.

Table 8. Descriptive Analysis.

Variable / Dimension	Nº Items	Mean	Median	SD
CA	10	4.40	4.00	0.84
CCA	2	4.20	4.00	0.92
SCA	5	4.50	4.50	0.85
PCA	3	3.90	4.00	0.74
IM	10	5.50	5.00	0.71
RIM	4	4.50	5.00	1.27
PIM	6	6.10	6.00	0.88
IB	12	4.40	4.50	0.97
IIB	6	4.10	4.00	1.10
EIB	6	4.80	5.00	0.79
ISO	1	1.80	2.00	0.42
PD	1	2.60	2.00	1.58
EM	1	1.80	2.00	0.79
Years of International Activity	1	5.00	4.50	1.25
Countries with International Activity	1	6.20	7.00	1.40
Yearly Turnover	1	5.00	5.00	2.00

% Turnover international business	1	4.60	4.50	1.90
% Turnover to R&D	1	4.20	4.00	2.39
Total number of Employee	1	6.20	7.00	1.03
% Employee international business	1	2.20	1.50	1.93
Main International Activity	1	1.80	2.00	0.42

In 2018, around 50% of companies had an annual turnover of more than 150 million euros and all of them had more than 300 employees. In the review of the pharmaceutical sector, we identified that pharmaceutical companies have an average turnover of 25 million euros and 49 employees. Our study has shown that internationalized PPI has a significantly greater dimension than the average of this sector. Of the sample, about 50% of companies have been internationally active for over 20 years and about 70% of respondents have international activity with more than 50 countries. In about 70% of the companies, the income generated by the international business is greater than 45% of the total revenue. These figures suggest a consolidated international activity in the PPI export sector. Only 20% of respondents have innovative products as the main object of internationalization. About 50% of respondents export generic medicines (commodities) and the remainder are dedicated to manufacturing for third parties or export other products. In about 60% of the target companies, the investment in R&D is relatively moderate, less than 15% of the total revenue, and in 40% of the sample, it is less than 9%. These values are consistent with data from other studies, confirm that the investment in R&D in PPI is significantly small, and bellow the international average.

The International Strategic Orientation

In 80% of the studied companies, the international strategy's definition is not conditioned by the local market, suggesting more developed stages of internationalization (mean = 1.8; median = 2.0). This data suggests that PPI defines internationalization strategies with a focus on target markets. ISO in foreign markets is associated with more CA and IM, predominantly PIM. These companies have bigger international experience and present a higher turnover. In addition, these companies tend to invest more in R&D and human resources. These results are in line with previous research [40,60].

Entry Mode Selection

We observed that companies use several EM, depending on the characteristics and opportunities in each of the targeted markets. But we confirmed a clear preference for WEM, in 80% of the cases, either with the export activity managed directly from Portugal or through contracts with local distributors (mean = 1.80; median = 2.0). None of the respondents chooses the implementation of local branches and/or manufacturing units as the preferential EM. We also observed that companies that elect IEM seem to have more CA, less perception of IB and a higher degree of internationalization. Innovative companies choose IEM and a higher degree of complexity, in line with Andersen et al. [35].

Competitive Advantages

The surveyed sample did not give a clear evidence to CA as a lever for international business (mean = 4.40; median = 4.00, at the center of the scale). When we observe individually each dimension, there seems to be a trend for greater emphasis on SCA (mean = 4.50; median = 4.50), particularly in items related to customer satisfaction and technical/regulatory support provided to customers. However, there is no particular highlight in the PCA (mean = 3.90; median = 4.00).

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Internationalization Motives

The values found in this variable suggest an evidence on IM, with scores much higher than those found in CA (mean = 5.50; median = 5.00). A significant weight is given to the PIM (mean = 6.10; median = 6.00), with particular emphasis on the long-term growth perspective. The most evident RIM is the decline of the local market. Anil et al. (2016) established a positive correlation between IM and international performance. The descriptive analysis of our study suggests a similar trend.

Barriers to Internationalization

The analysis of this variable allowed us to have a better understanding of the barriers and their nature, handled by PPI in their international ventures. There was a slight trend towards greater evidence of EIB (mean = 4.80; median = 5.00 vs mean = 4.10; median = 4.00 on IIB) as the biggest obstacle to internationalization. Barbosa et al. [19] observed that the reduced institutional support had a negative influence on export performance. Our study is in line with these conclusions. The most evident IB was the reduced support for internationalization received from the Portuguese Government. Customs tariffs, regulatory requirements and cultural differences were also highlighted.

The Psychic Distance

About 60% of respondents considered the internationalization markets "very different" or "quite different" from the local market (mean = 2.60; median = 2.00). The perception of PD is higher in companies with ISO focused overseas. Shoham et al. [60] observed the same tendency, but in our study, the intensity was much higher. Johanson and Vahlne [25], in the creation of the Uppsala model, associate PD with the degree of internationalization. Wrona and Trapczynski [7], when studying the internationalization of pharmaceutical companies, concluded that risk perception is lower in countries that are culturally closer (with lower PD), in the same sense as defined in the Uppsala model. In our study, we found a greater perception of PD in companies that choose WEM, in contradiction with the conclusions of the studies mentioned above. We also found that the perception of PD seems related to a higher perception of IB, in this case, according to previous studies. Given this controversy, our results go in line with Evans and Mavondo [51], who refers to the results found in the PD as often controversial and paradoxical, probably because results from the manager's perception and interpretation of a given market [53].

Associations and Dependencies between study variables

Study of Correlations

Table 9. Results of Spearman's Correlation Tests (r_s)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Competitive Advantages	1. CA	1																	
	2. CCA	0,662*	1																
	3. SCA	0,902**	0,434	1															
	4. PCA	0,548	0,481	0,347	1														
Internationaliz. Motives	5. IM	0,480	0,425	0,326	-0,004	1													
	6. RIM	-0,123	-0,020	-0,111	-0,475	0,375	1												
	7. PIM	0,702*	0,690*	0,661*	0,349	0,650*	-0,190	1											
Internationaliz. Barriers	8. IB	-0,605	-0,321	-0,502	-0,524	0,022	0,479	-0,337	1										
	9. IIB	-0,758*	-0,240	-0,785**	-0,507	-0,015	0,485	-0,419	0,878**	1									
	10. EIB	-0,407	-0,258	-0,360	-0,239	0,045	0,404	-0,364	0,864**	0,667*	1								
11. PD		-0,256	-0,325	-0,236	0,189	-0,678*	-0,518	-0,436	-0,428	-0,264	-0,280	1							
12. Years Intern. Activity		0,218	-0,038	0,448	0,131	-0,510	-0,155	-0,066	-0,017	-0,293	-0,063	-0,047	1						
13. Intern. Experience		0,583	0,628	0,372	0,464	0,514	-0,023	0,619	-0,141	-0,132	-0,241	-0,612	0,133	1					
14. Yearly Turnover		0,313	0,534	0,067	0,465	-0,061	-0,235	0,017	-0,215	-0,195	0,034	-0,058	0,085	0,245	1				
15. % Turnover Inern.		0,504	0,540	0,367	0,693*	-0,018	-0,299	0,458	-0,717*	-0,525	-0,749*	0,139	0,168	0,535	0,143	1			
16. % Turnover on R&D		0,519	0,445	0,279	0,846**	0,089	-0,589	0,406	-0,480	-0,444	-0,367	-0,026	0,147	0,716*	0,489	0,650*	1		
17. Employee		0,384	0,420	0,190	0,772**	0,122	-0,517	0,339	-0,335	-0,380	0,000	0,037	-0,115	0,264	0,701*	0,288	0,694*	1	
18. % Employee Internat.		0,518	0,711*	0,385	0,299	0,180	-0,388	0,556	-0,234	-0,288	-0,267	-0,371	0,254	0,608	0,667*	0,292	0,560	0,461	1

*. $p = 0.05$ **. $p = 0.01$

Competitive Advantages in Internationalization

We observed a strong positive correlation between CA and PIM (rs = 0.702; p <0.05). This correlation was evident in the CCA and SCA (rs = 0.690 and 0.691 respectively; p <0.05), but not in the PCA. Kaleka and Morgan [63] observed similar results with these variables and their correlation with international performance. PCA have a strong positive correlation with a higher income from international activity (rs = 0.693; p <0.05) and with R&D investment (rs = 0.846; p <0.01. Ferreira and Simões [45] observed marginal correlations between CCA, PCA and internationalization performance. The object of our study is different, but our results reveal stronger correlations, especially at the PCA level, perhaps because this variable may have greater weight on the pharmaceutical sector's competitiveness.

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Internationalization Barriers

This variable was identified in the literature review due to his potential negative impact on internationalization ventures. We identified a strong negative correlation between the perception of IB and higher revenue from international activity ($rs = -0.717$; $p < 0.05$), particularly in the EIB ($rs = -0.749$; $p < 0.05$). Anil et al. [48] identified a positive impact of EIB on internationalization performance, in the authors' opinion, a surprising and unexpected result. Our results are more consensual although diverging from those found by Anil et al.

The Psychic Distance

The figures on this variable must be inverted before analysis because lower values on the scale correspond to a higher perception of the variable. We found just one positive correlation: between higher PD and higher IM ($rs = -0.678$; $p < 0.05$). These results somehow endorse the conclusions of other investigations. Evans and Mavondo [51] refer to the results with PD as, often, controversial and paradoxical, confirming the reduced consensus about the impact of this variable in the internationalization process.

The Control Variables

We identified strong positive correlations between R&D's investment and the most internationalized companies ($rs = 0.716$; $p < 0.05$) and with the highest international turnover ($rs = 0.650$; $p < 0.05$), confirming the conclusions of Chittoor and Sougata [14] and Rentala et al. [22]. Reis and Forte [69] found that several characteristics of companies (ISO and size, among others) are important determinants of export intensity. Our results seem to confirm these conclusions. On the other hand, we found no association between international experience and higher income from international activity, in contrast to many citations found in the literature, which refer to a positive correlation between these variables [45].

Inferential Analysis

Considering the nature of the variables, we used the Mann-Witney non-parametric tests to study our variables and identify significant differences between them.

Table 10. Mann-Whitney tests for the International Strategic Orientation variables, Entry Mode and Main Export Activity.

	Mann-Whitney 'U	Wilcoxon W	Z	Sig. (bilateral)
International Strategical Orientation (ISO)				
CCA	0.000	3,000	-2.244	0.025
PCA	1,000	4,000	-1,984	0.047
Yearly Turnover	0.500	3,500	-2.034	0.042
Entry Mode (EM)				
RIM	0.000	3,000	-2.169	0.030
% Employee international	0.000	36,000	-2,260	0.024
Main Intern. Activity	0.000	3,000	-3,000	0.003

	Main International Activity			
RIM	0.000	3,000	-2.169	0.030
EM	0.000	36,000	-2.236	0.025
% Employee international	0.000	36,000	-2,260	0.024

We have found significant differences in CCA, PCA and yearly turnover, concerning ISO. CCA and PCA are significantly superior in companies whose ISO is focused on international markets (U = 0.000; p = 0.025 and U = 1,000; p = 0.047 respectively). In the same sense, companies with a bigger focus on international markets have higher levels of revenue (U = 0.500; p =0.042).

WEM is associated with RIM (U = 0.000; p = 0.030). IEM are associated with greater investment in human resources and innovation in international activity (U = 0.000; p = 0.024 and U = 0.000; p = 0.003 respectively). Wrona and Trapczynski [7], in their study on the internationalization of PI, found that EM selection is the result of the balance between risk and market potential on target markets. The design of our study is substantially different but goes in the same direction because we found that IEM is significantly associated with less RIM, more employees in international areas and a higher degree of innovation in export activity.

Concerning the category of products exported, we found a greater perception of RIM associated with commodities' export focus (U = 0.000; p = 0.030). In the same sense, companies whose object of internationalization is based on innovation are associated with greater investment in human resources and IEM (U = 0.000; p = 0.024 and U = 0.000; p = 0.025 respectively). Our results confirm the conclusions of other researchers. Chittoor and Ray (2007) observed that innovative PI have better international business' profitability indicators. Rentala et al. [22] confirmed a positive impact of innovation and international

5. Discussion

The Portuguese pharmaceutical export sector is made of companies with a significant annual turnover, number of employees and international experience. The companies' dimension is significantly higher than the sector's average. The international experience is well consolidated; companies have been exporting for more than 15 years and have international activity with more than 50 countries. Their global results are considerably dependent on international business. In a recent framework carried out on the Portuguese industrial sector, Reis and Forte [69] established that the size of companies, measured by the number of employees, is a determinant of export intensity in industrial companies. In our study, we also identified a strong correlation between the number of employees and total turnover. However, we have not found a significant association between international experience and the other's study variables, thus in this sector, international experience has no impact on internationalization, in contrast to many citations found in the literature [45]. Fina and Rugman [12], in their case study of the internationalization strategies of an American pharmaceutical multinational, concluded that the international experience and the degree of internationalization are both important determinants of the company's global results. Barbosa et al. [19] also confirmed the international experience as an important determinant of internationalization in Colombian pharmaceuticals. Our results in the Portuguese exporting pharmaceutical sector did not confirm these conclusions. Buckley and Chapman [11], when studying the internationalization of medium-sized English pharmaceutical companies, found the internationalization attitudes derive from the company's global strategy, but are conditioned by the immediate context and previous internationalization experiences.

They also observed an interesting point: medium-level managers often redefine the internationalization strategy and this fact create constraints on the overall results. Perhaps we can find a similar reality in the exporting PPI, but this cannot be assumed in our framework. We believe that this point might be well studied in future research. The exporting PPI follows an internationalization model focused on the development of each company's resources and capabilities. Is based on the development of internal resources, the acquisition of capacities and the creation of CA, which, in turn, have a positive impact on the degree of internationalization. These characteristics are similar to those found in the Uppsala internationalization model as we have identified a strong perception of PD in Portuguese pharmaceutical companies, one of the key ideas of this model [25]. We also identified a tendency towards a lower perception of PD in less internationalized companies, another assumption of this model, but also a trend towards an incremental internationalization, from WEM (exports managed from Portugal), prevalent in companies with less depth of internationalization, to IEM used by deep internationalized companies, with a greater degree of commitment and investment. However, it is not possible to assume that PPI's internationalization model follows an incremental pattern. We found that the PPI' ISO is predominantly focused on foreign markets. We have also shown that companies with ISO in the international markets have significantly higher number of CA and higher revenue, confirming the literature review [40]. On the other hand, we observed that ISO focused on the Portuguese market is a conditioning of international development, with negative impact in internationalization's intensity and outcomes. Our study revealed unequivocally that PD is a relevant variable in the PPI export sector. Nevertheless, concerning the different ISO we have not identified differences nor associations between them. However, it was possible to identify higher PD perception in companies with ISO focused on foreign markets, companies with less investment in internationalization and a lower degree of innovation. The perception of IB was higher in companies with greater perception of PD, confirming previous research carried out on this variable [7,54].

It was not possible to understand the relationship between PD and the other variables. Other authors [51] cite the results obtained with this variable as controversial and paradoxical. To overcome this problem, Sousa and Lages [54] developed a new scale to improve the perception of PD because they identified inaccuracies in the construction and evaluation of the PD, namely the confusion with the cultural distance, another variable with different characteristics. It seems prudent to study the behavior of PD in PPI, specifically how PD influence or interact with other's internationalization variables, in particular with ISO and the possible impact on company's turnover and global effectiveness. Companies with more CA, especially if they are sustainable, are associated with higher international performance [6]. Our study demonstrated a strong correlation between CA and PIM, in particular CCA and SCA. We also confirmed that the higher perception of CA corresponds to a lower perception of IB. We also revealed an interesting positive correlation between PCA development and higher international revenue and R&D investment. However, the CA were globally under-evidenced, especially the attributes related to innovation and exclusivity of marketed products, suggesting a lack of competitiveness of PPI in the international scenery. Several authors [7,14] found a strong association between CA related to innovation, R&D, the development of innovative products and the highest performance and degree of internationalization. The lower perception of PCA reveals a weakness in the PPI that can condition the sustainable development of internationalization. This is supported by the weak results in the innovation indexes, given that only 20% of the surveyed companies have innovative products as their main object of internationalization and, on the other hand, the resources allocated to R&D are substantially lower than in other countries. However, we found that the most innovative companies are more proactive and invest more in human resources for the international ventures.

Our investigation revealed that PPI's internationalization strategies are predominantly proactive, most likely framed in the company's global development strategy. One of the main reasons for internationalizing is the decline and loss of profitability in the Portuguese market, which is compatible with the conclusions of the sector, previously carried out. As confirmed by previous research [48], companies that emphasized IM have better overall results. It was also possible to understand that the companies significantly perceived the IB, whether IIB or EIB. Although Anil et al. [48] have found a positive relationship between this variable and the performance of internationalization, in the opinion of the authors an unexpected conclusion; our results go in the opposite direction, in line with the literature review carried out on this variable [70]. The most relevant IB are the reduced support from the Portuguese Government Institutions and the difficulties in receiving reliable information from the target markets. These findings suggest that Government institutions may play an important role as a lever for internationalization, giving better institutional support to the sector.

When expanding the activity to other countries, a pharmaceutical company can choose different EM depending on the characteristics of the target market. However, PPI relies predominantly on WEM. None of the respondents has the direct investment as the main EM, which, in Root's opinion [50], corresponds to the highest degree of international development. This limitation may be due to a still reduced stage of the sector's international development or, perhaps, the biggest limitation is the relative lack of competitiveness on a global scale. In our study, we also observed that companies who decide on IEM seem to have more CA, less IB and a higher degree of internationalization; innovative companies choose IEM and a higher degree of complexity, in line with Andersen et al. [35].

Our study confirmed that the companies with the highest investment in R&D also correspond to the most internationalized companies. We also found a strong positive correlation between R&D investment and international revenue, confirming the conclusions of other authors [14,22]. We also confirmed strong positive correlations between higher revenue and R&D and employee investments. Reis and Forte [69] found several characteristics of companies (ISO and size, among others) are important determinants of export intensity. The correlations found in our study seem to confirm these conclusions.

6. Conclusions

Portuguese exporting pharmaceutical sector is responsible for about 2% of total Portuguese exports [28] and has an export intensity above the overall industry's average [30]. The volume of exports may double in the next three to five years [71]. This sector assumes a strategic relevance in the Portuguese's economic context. However, it faces strong sustainability challenges resulting from the high competitiveness and complexity that characterize the pharmaceutical marketplace on a global scale. It also stems from the loss of profitability in the local market, still the main source of income for most companies in the sector. Export PPI is characterized by companies with a larger dimension than the sector's average. Export PPI has a reasonable international experience and has an ISO predominantly focused on foreign markets. However, per se, this is not enough to guarantee the good results expected in internationalization since we have verified that the international experience has no impact on the global outcomes.

We conclude that exporting PPI have a low innovation rate. About 80% of the sector's exports are based on products/activities with little or no innovation. This is, perhaps, one of the conclusions that raise great concern because the activities with lower degree of innovation are associated with poorer commercial margins [6] and, as we have confirmed,

less investment, sophistication and less proactive attitudes in the definition of internationalization strategies. This conclusion is supported by the reduced evidence in CA, mainly in PCA, in line with the reduced investment in R&D and innovation, well confirmed in our investigation.

Our conclusions reinforce the need for greater investment in activities with a higher degree of innovation, which create sustained CA, especially in terms of marketed products, which allow the creation of innovative and sustainable long-term internationalization strategies. This also stimulates the increase of the degree of internationalization, the number of operating markets, and the reduction of local market dependence, increasing overall results. The results of the theoretical framework and the empirical study allow us to conclude that the PPI follows an internationalization model based on the development of its own resources and capacities, in an incremental way. The EM are predominantly risk-free and without investment. Another important conclusion of our study is the confirmation of the reduced institutional support to internationalization initiatives of the PPI. The institutions that oversee this sector should increase their understanding of the barriers that this sector faces and guide their cooperation and assistance strategies for the international expansion of PPI. PPI have their origins on companies with a predominantly familiar structure, which have developed their activity in the local marketplace over the years and, gradually, in international markets. The limitations identified in the R&D investment, innovation and more sophisticated internationalization models, can have their roots in the sector's structure and in the weaknesses of resources that historically characterize it.

Implications, Limitations and New Research Lines

Our research can have important implications for improving the profitability ratios of the PI in a small economic environment. PPI's sustainability heavily depends on expansion to international markets, reducing the local market's dependence, which is still very high. It also depends on the increase in innovation in terms of the marketed products and the increase in R&D investment. For this, the PPI should obtain better information on the target markets, which allows the identification of niches and opportunities. The limited availability of resources and capabilities should be focused on the development of sustainable CA, leveraging the development of the business on a global scale. This strategy can increase the overall profit and maximize the international experience this the sector already has. Our conclusions are equally important for those in charge of government institutions, in terms of the sector's needs of support identified in our study. It was clear the limitations in investment capacity and the need for better support about the targeted markets. In the academic field, this study constitutes an advance in knowledge about the factors and determinants of the internationalization of a specific sector of the economy. Intends to be a modest contribution to stimulate curiosity about the pharmaceutical export sector and arouse new investigations that explain the relationships and interactions between the variables of internationalization and the impact of each on the sustainability and overall performance.

This empirical study has some limitations that it is important to bear in mind when interpreting its results. The size of the universe is small, with only 16 companies. Despite the high representativeness of the sample, 63% of the universe, confirmed by three independent stratification variables, is a sample of 10 companies, which is also very small. This fact conditioned the selection of some statistical tests, limiting the choice to those presented in this investigation. In future research, it would be pertinent to study the impact of international experience and PD on the sustainability and performance of this sector. This framework may be completed with new research, focused on the definition of a conceptual model for the internationalization of the pharmaceutical sector.

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