

Hybrid multicriteria technique for international markets selection based on the analytic hierarchy process

Técnica híbrida multicritérios para a seleção de mercados internacionais baseada no processo analítico hierárquico (AHP)

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Abstract

Purpose: To present a rigorous technique for merchandise companies that are internationalizing and pursuit the best options of export markets to direct their products.

Originality/value: The literature suggests that companies, especially small and medium enterprises (SME), due to their lack of experience when participating in international business, tend to employ uncertainty processes that affect in decision making when exporting. For this reason, an innovative multivariable technique for international markets selection (IMS) is presented, in which factors such as trade barriers, economics, cost, logistics and culture are considered.

Design/methodology/approach: Consulting different databases obtained from the internet, it was possible to analyze the factors indicated above, which, in turn, are integrated by different variables. Thus, this work used a multivariable methodology and/or technique that is complemented with the analytic hierarchy process (AHP) to assign the weights of each factor and their respective variables; all this, including a survey among experts and members of the foreign trade department of the company under study, in this case, dedicated to the production of confectionery.

Findings: According to the statistical data processed with the multivariable technique and weighted with the AHP process, the results suggest that by their score the best export markets are Ireland, Netherlands and Denmark. In this sense, the empirical evidence indicates that the pointed countries are the most attractive markets for the factors considered, as well as for their general features.

Keywords: international markets selection, SME, exportation, internationalization, multivariable method

Resumo

Objetivo: Apresentar uma técnica rigorosa que auxilie as empresas comerciais que estão se internacionalizando a identificar as melhores opções nos mercados de exportação para direcionar os seus produtos.

Originalidade/valor: A literatura sugere que as empresas, especialmente as pequenas e médias (PME), devido à sua falta de experiência em negócios internacionais, tendem a empregar processos imprecisos que afetam a tomada de decisões quando exportam. Por essa razão, é apresentada uma técnica multivariável inovadora para a seleção de mercados internacionais (IMS), em que fatores como barreiras comerciais, economia, custo, logística e cultura são considerados.

Design/metodologia/abordagem: Consultando diferentes bancos de dados obtidos da internet, foi possível analisar os fatores indicados acima, que, por sua vez, estão integrados por diferentes variáveis. Assim, este trabalho utilizou uma metodologia e/ou técnica multivariável, complementada com o processo analítico hierárquico (AHP), para atribuir os pesos de cada fator e suas respectivas variáveis. Para tanto, foi incluída uma pesquisa com especialistas e membros do departamento de comércio exterior da empresa em estudo, nesse caso, dedicada à produção de confeitaria.

Resultados: De acordo com os dados estatísticos processados com a técnica multivariável e ponderados com o processo AHP, os resultados sugerem que, por sua pontuação, os melhores mercados de exportação são Irlanda, Holanda e Dinamarca. Nesse sentido, as evidências empíricas indicam que os países listados são os mercados mais atraentes para os fatores considerados, bem como para suas características gerais.

Palavras-chave: seleção de mercados internacionais, PMEs, exportação, internacionalização, método multivariável

INTRODUCTION

There is a remarkable diversity of aspects to be considered in the internationalization process when a company seeks to sell its products to foreign markets. It is also essential to consider that large companies seek this purpose in a different way than small and medium enterprises (SME) do. This is because large companies have a greater financial capacity than SME, which helps them not only to better prepare the internationalization process by hiring other firms to track the best markets when exporting, but, also, because large companies usually have economic resources that allow them to better face the challenges of participating in other markets (Hollensen, 2008).

The international markets selection (IMS) can be understood as a detailed process of identifying potential buyers, recognizing opportunities, and, especially, the viability of carrying out an export in a particular country and market. This type of study also involves a systematic and methodical exercise through which a series of specific variables are examined. All of this is done through a specific model to produce a result expressed as processed information that will help export traders to make effective decisions that will guarantee the success of the potential operation (Hussein et al., 2019).

Thus, according to Baptista (2005), over time, companies have become significantly more interested in selling their goods in other countries and other markets not only because of the opportunities offered by globalization, but also because governments themselves are increasingly developing trade policies that seek to increase their participation in foreign trade. In this sense, exporters must consider the attractiveness of a market with the compatibility of the products they produce and, above all, all with the characteristics of their own company. Therefore, in view of the growing need for the implementation of tools that facilitate the decision-making process related to the choice of foreign markets, the development of new techniques is now an essential aspect to achieve business internationalization with the lowest possible levels of uncertainty.

This way, the outstanding scientific and technological advances promote the implementation of techniques for the IMS applied to the case of export of goods, reduce operational risk and increase the rigor of the internationalization process, strengthening the economic and financial success of any organization (Cano & Baena, 2015; He et al., 2016). Similarly, nowadays the access to new information technologies and diverse databases caused companies and their foreign trade departments, led by personnel increasingly qualified by their academic training and experience in international business (Baena-Rojas & Hurtado, 2017), to adopt new strategies that the same

theory and field of the study suggest for their implementation as it happens with multicriteria methods to enhance the decision-making process (Calof & Beamish, 1995; McNaughton, 2001; Pflanz, 2013).

The present work focused then, in accordance with the above, on reproducing a multivariate technique developed by Baena-Rojas et al. (2020) not only with the purpose, on the one hand, of reducing the uncertainty of the companies during the process of IMS for export, but also, on the other hand, with the purpose of making known how this technique that supports the decision-making process in business internationalization can be very useful in other growing industries different from those previously addressed by the referent authors. This study focuses on the confectionery industry in Colombia, considering that, in 2018, it presented a growth of 8.8% and a contribution of 4% to the generation of employment in the food sector of the country (Asociación Nacional de Empresarios de Colombia – Andi, 2019).

The main objective of this article is to find the best market for the export of Colombian confectionery products, according to the multivariable technique reproduced, starting with a preselection of the best markets for their worldwide demand. In order to carry out the proposed study, this document is divided as follows: after this introduction, the next section analyzes the theoretical foundations of the topics covered through a review of the current literature, in which the most prominent authors in the field are also cited, including the reference work on IMS; the third section describes the methodological procedures adopted, followed by the fourth, in which the results of the research are presented and analyzed. Finally, the fifth section presents the final considerations of the study.

LITERATURE REVIEW

Absence of strategic export plans

Aranda and Montoya (2006) and Rodrigues and Dieleman (2017) highlight the internationalization of companies as a solid option to ensure sustainability over time. This leads to the fact that companies have to be prepared to face the challenges involved in their participation in international markets. In this sense, strategic export plans play a fundamental role within companies, as they are directly linked to the performance of a product in a given market, understanding that it is a context in which not only the financial capacity to reach it is crucial, but also other components such as logistical, cultural, commercial and strategic factors (Clark et al., 2018).

In contrast to the above, despite the proven relevance that strategic export plans can have on success in foreign markets, authors such as McNaughton (2001) and Crick and Spence (2005) found that these are not widely used by entrepreneurs, but, on the contrary, decision making regarding exports often arises from intuitive processes without any support in formal sources or expert recommendations, leaving aside systematic plans for IMS by improvised positions that may decrease their effectiveness in international lines. This little use of strategic export plans, according to Dana et al. (2016), may be influenced by different factors among which the overconfidence on the part of entrepreneurs stands out mainly as a cause of making decisions without prior knowledge. Similarly, the lack of proactivity in planning, the short geographical distance, and familiarity with the destination country are variables that lead organizations not to carry out an adequate internationalization plan (Lukas et al., 2007).

In addition, more recent studies indicate that the immediacy of improvisation in decision making regarding new markets can negatively influence the selection of the most appropriate entry modes and the identification of long-term opportunities, resulting in inexperienced decisions being made and operations not reaching the expected maximum performance (Bingham, 2009; Whalen & Boush, 2014). The issue mentioned above, according to Pascucci et al. (2016), is also a result of the lack of preparation of entrepreneurs, identifying the lack of long-term strategies, generalization of knowledge about foreign markets, lack of intercultural knowledge, poor proficiency in foreign languages and lack of knowledge about the functioning of international trade institutions. However, authors such as Nemkova et al. (2012) and Oey et al. (2018) support that the combination of improvisation and strategic planning can have positive results in the international market as long as it is accompanied by the use of tools that allow comparing markets and constantly analyzing secondary information sources.

The relevance of information processing in international markets selection (IMS)

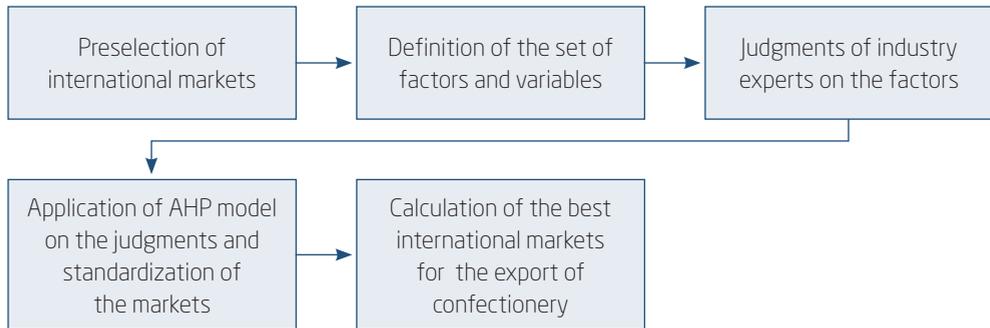
Following the line of the previous section, when implementing strategies during the internationalization process, secondary information sources become a vital factor for success in foreign markets. In this sense, the use of reliable information during IMS allows comparing the characteristics and determining factors for the identification of potential buyers (Chen & Messner, 2011; Musso & Francioni, 2014). Similarly, authors such as

Papadopoulos and Martín (2011) and Toften and Hammervoll (2011) point out that the proper manipulation of statistics on export markets allows improving the choice of entry mechanisms to these markets, the level of adaptation to internal regulations, and the degree of acceptance by the market niche. Considering this, IMS strategies should be based on the use of rigorous processes and the analysis of information sources to optimize the decision-making process for entrepreneurs seeking to establish the alternatives with the greatest affinity to their priorities (Ragland et al., 2015; Baena et al., 2018).

Within the context of IMS research, the use of quantitative tools and models such as logistic regression, gravity models, optimization algorithms and fuzzy logic has become relevant, which have been useful to improve decision making in organizations (Alexander et al., 2011; Van den Heuvel et al., 2012; Marchi et al., 2014; Viswanathan & Jha, 2019). However, when faced with situations in which multiple variables and alternatives are involved, the multicriteria analysis models stand out for decreasing the levels of uncertainty and glimpsing the best options in complex problems, similarly to those faced by companies on their way to internationalization or seeking to reach new international markets (Górecka & Szałucka, 2013; Schühly & Tenzer, 2017). Thus, the effectiveness of multicriteria tools has allowed solving problems in diverse contexts, such as risk management, benchmarking, and supplier selection (Narasimhan et al., 2006; Brito et al., 2010; Carnero, 2014). Therefore, its implementation to improve the segmentation of export destination countries would help business development and internationalization (Aghdaie & Alimardani, 2015).

METHODOLOGY

The methodology proposed by this research is divided into four sections, seeking to fully describe the steps carried out in the IMS process, as indicated in Figure 1. The first section focuses on the preselection of global markets buyers of confectionery. The second one focuses on the definition of the set of factors and variables as criteria to measure the stipulated international markets. Then, in the third section, the process of selecting experts and collecting their criteria with respect to the established variables is described. Finally, in the fourth section, the analysis models used to define the most viable international markets for the export of confectionery products are highlighted.

Figure 1**Methodological process proposed for the IMS**

Source: Elaborated by the authors.

Preselection of international markets

Considering the method initially proposed by Baena et al. (2018), a preselection of international markets was carried out to include countries with high import rates of confectionery products. For this purpose, it was necessary to use the information provided by the International Trade Centre (ITC, 2020), through which it was possible to determine the 20 main confectionery importers under tariff heading 17.04.90 worldwide during 2019.

Definition of general and specific criteria

Ozturk et al. (2015) conclude that the preference for an international market is the result of the interaction of a vast set of variables including demographic, political, economic, socio-cultural, market and trade barriers aspects. We sought to establish a conglomerate of variables that is sufficiently broad to reflect the elements that intervene in the business reality during the decision-making process, as opposed to the IMS for exports. To achieve this, the factors and variables proposed by López-Cadavid et al. (2020) were used, comprising a total of five general dimensions and 23 specific variables, as indicated in Figure 2. Likewise, each of these factors is supported by indicators in official sources, allowing, thus, comparison between countries.

Figure 2

Presentation of the IMS methodology criteria by alphabetical order

Factor	Variable	Source
Costs	Cost to import border compliance (CIBC)	World Bank (2018)
	Internal transport (INTR)	Ministry of Transport (2020)
	International transportation cost (INTC)	World Freight Rates (2020)
	Official exchange rate (OFER)	OECD (2019)
	Target market price (TAMP)	Precios Mundi (2020)*
Cultural environment	Corruption perceptions index (COPI)	Transparency International (2019)
	Cultural distance (CUDI)**	Hofstede Insights (2020)
	Ease of doing business (EADB)	World Bank (2019)
	Globalization index (GLBI)	KOF Swiss Economic Institute (2017)
Economics	Cost of living index (COLI)	Numbeo (2020)
	GDP per capita (GDPP)	World Bank (2019a)
	Risk country time to resolve insolvency (RCRI)	World Bank (2019b)
	Unemployment rate (UNRA)	World Bank (2019c)
Logistics	Frequency (FREC)	Procolombia (2020)
	Geographic location (GELO)	World Risk Report (2020)
	Geographical distance (GEDI)	Distance (2020)
	Logistics performance index (LOPI)	World Bank (2018a)
	Transit time (TRTI)	Sea Distance (2020)
Trade barriers	Index of economic freedom (INOF)	The Heritage Foundation (2020)
	International competitiveness (INCO)	World Economic Forum (2019)
	Non tariffs barriers (NTBS)	World Bank (2020)
	Protectionism in general (PRIG)	Global Trade Alert (2020)
	Tariffs barriers (TABS)	WTO (2020)

Source: Adapted from López-Cadavid et al. (2020).

* This tool is commonly used to compare prices at a global level for different products. However, the confectionery products, in particular, were not included in the records of this database. Therefore, a search of the average sales prices of these products in the main supermarket's websites of the 20 selected countries was made.

** The cultural distance is the result of the combination of several dimensions, such as power distance, individualism, masculinity, uncertainty avoidance, long-term orientation, and indulgence, obtained from all 20 countries analyzed in comparison to Colombia.

Selection of expert evaluators of the criteria

Taking into consideration the already mentioned boom in the confectionery sector, we sought to demonstrate the applicability of the IMS methodology through its implementation in the specific case of a renowned confectionery company in Colombia. For this purpose, a sample of 11 experts (analysts, supervisors, coordinators, and directors) belonging to the company's foreign trade department was defined through an intentional non-random method. Subsequently, face-to-face and telephone interviews were conducted with the experts, seeking to qualify, from their experience in international business, the relevance of each of the factors and variables at the time of selecting an international market for export. Thus, the nine-point scale proposed by Saaty (2008) was used, in which the values corresponded to 1 (equally influential), 3 (moderately influential), 5 (notably influential), 7 (strongly influential), 9 (extremely influential) and 2, 4, 6 and 8 for the trials with an intermediate level of influence.

Data processing and analysis

Once the judgments of the group of experts were obtained, the processing and analysis of the information collected was carried out by combining two models. The first one corresponds to the model of AHP, created by Saaty (1980), which is a mathematical tool that allows analyzing problems with multiple variables and alternatives, through the successive decomposition of the factors, from the judgments granted by the group of experts. Meanwhile, the second model used corresponds to the normalization tool initially developed by Baena et al. (2018) and improved by Baena-Rojas et al. (2020), whose utility lies in the final weighting of international markets, considering the importance given to factors and variables. The methodological steps followed for the development of the models are described below:

Initially, the experts' judgments regarding each category are entered into a system of paired matrices to identify their proportions, as highlighted in Equation 1.

$$A = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{bmatrix} \quad (1)$$

Then, the set of weights assigned at a general and specific level is solved according to the method of values and vectors of Saaty and Kearns (1985), as explained in equations 2, 3 and 4.

$$A_1 = \begin{bmatrix} a'_{11} & a'_{12} & \cdots & a'_{1n} \\ a'_{21} & a'_{22} & \cdots & a'_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a'_{n1} & a'_{n2} & \cdots & a'_{nn} \end{bmatrix}, a'_{ij} = \frac{a_{ij}}{\sum_{i=1}^n a_{ij}}, i, j = 1, 2, 3, \dots, n \quad (2)$$

$$W = \begin{bmatrix} W_1 \\ W_2 \\ \vdots \\ W_n \end{bmatrix}, W_i = \frac{\sum_{i=1}^n a'_{ij}}{n}, W' = AW = \begin{bmatrix} W'_1 \\ W'_2 \\ \vdots \\ W'_n \end{bmatrix} \quad (3)$$

$$\lambda_{max} = \frac{1}{n} \left(\frac{W'_1}{W_1} + \frac{W'_2}{W_2} + \cdots + \frac{W'_n}{W_n} \right) \quad (4)$$

After obtaining the proportions, the degree of consistency of the general and specific matrices was measured, using a consistency scale of between 0 and 1. For this purpose, consistency index (CI), randomness index (RI), and consistency ratio (CR), proposed by Saaty (1997), were applied to the judgments, as expressed in equations 5, 6 and 7.

$$CI = \frac{\lambda_{max} - n}{n - 1} \quad (5)$$

$$RI_n = [0.00, 0.00, 0.52, 0.89, 1.11, 1.25, 1.35, 1.40, 1.45], n = 1 \dots 9 \quad (6)$$

$$CR = \frac{CI}{IA} \quad (7)$$

Later, as expressed in Equation 8, the results were grouped through the use of the geometric mean due to the heterogeneity of the scores obtained, as suggested by Forman and Peniwati (1998) for groups of experts with varied experiences.

$$a_{ij}^{Global} = \prod_{k=1}^m (a_{ij}^k)^{a_k} \quad (8)$$

Finally, knowing the degree of final importance of each variable for the group of experts, the proportions obtained were applied to the set of indicators shown in Figure 2. Each value obtained from the 23 sources consulted for the 20 international markets was normalized, weighted and classified in a scale from 0 to 5 points, depending on whether the value of these was directly proportional value (DPV) or inversely proportional value (IPV), as highlighted in Equation 9.

$$NV_{ij} = \begin{cases} \frac{x_{ij} * 5}{\text{Max}\{x_{ij}\}} & \text{if } x_{ij} \text{ is DPV} \\ \frac{\text{Min}\{x_{ij}\} * 5}{x_{ij}} & \text{if } x_{ij} \text{ is IPV} \end{cases} \quad \forall i = 1, \dots, I \quad (9)$$

in which:

NV_{ij} : normalized final value for the variable x ;

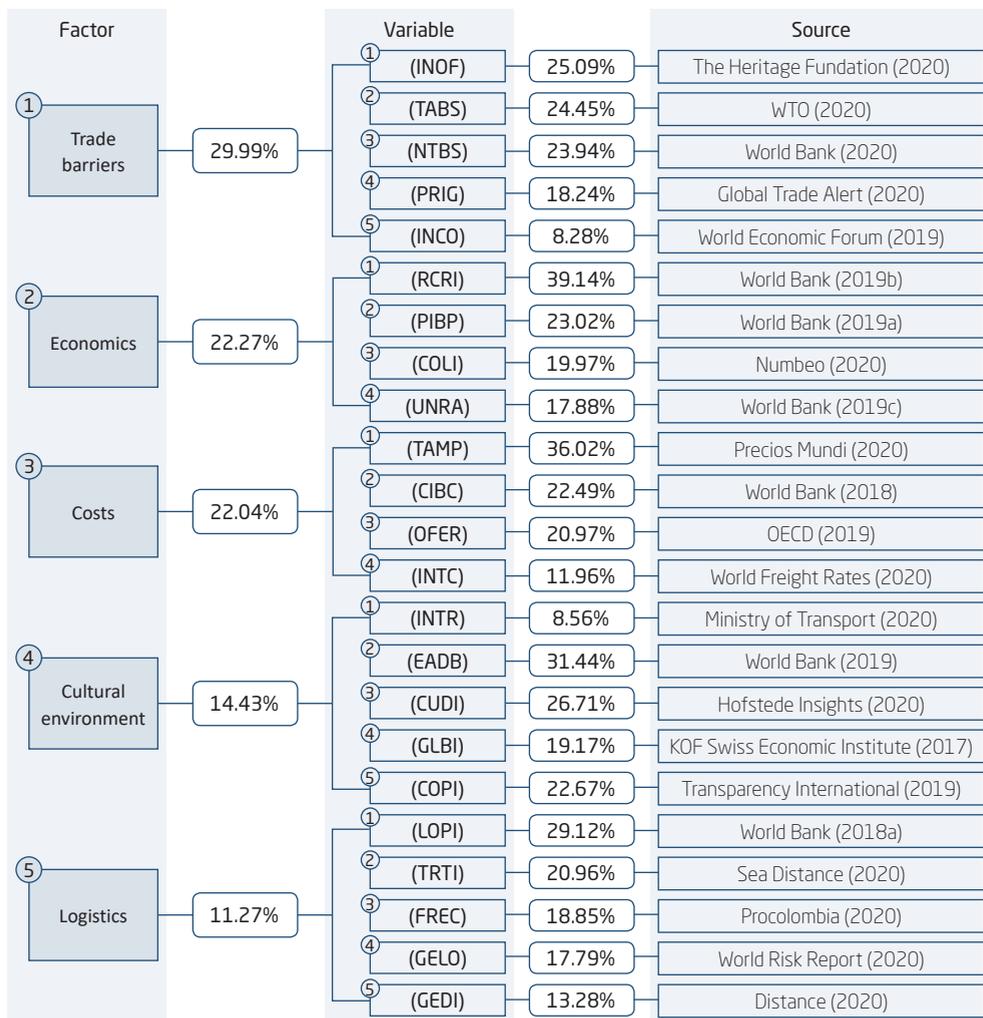
i : potential market;

j : factors evaluated in the IMS methodology.

RESULTS AND DISCUSSION

In this section, the weighting for each factor and each variable is presented based on Figure 2, applying the AHP technique with perceptions of all the 11 experts belonging to the company's foreign trade department. This way, it was possible to define the order of priority of each factor and each variable (see Figure 3), in order to analyze fully the preselected international markets according to their international demand.

Figure 3
Presentation of the IMS methodology criteria by priority order according to AHP



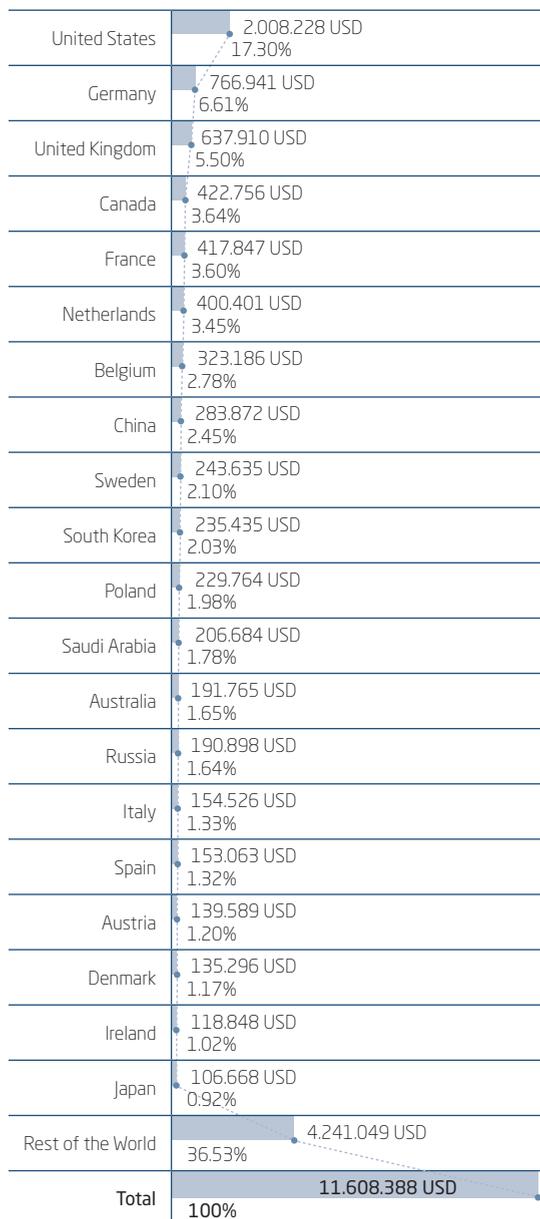
Source: Adapted from López-Cadavid et al. (2020).

In other words, the previous values of the IMS methodology criteria allow addressing this approach bearing in mind the real experience of all the staff in charge of the foreign trade department at the company targeted in the case study.

In the second part of this section are presented precisely the 20 markets preselected for this study. The current research is focused on confectionery products, then, it was identified the list of major importers (see Figure 4),

for the selected merchandise. This last procedure was carried out with the database of ITC (2020), with the custom code 17.04.90 in this specific case.

Figure 4
List of major importers of confectionery products preselected as markets



Source: Adapted from ITC (2020).

Note: The above values are expressed in US dollar thousands.

Hence, the IMS begins with the preselection of different countries with significant global demand confectionery values, which became a relevant segment and a potential scenario to direct the products from Colombia with the company under consideration.

In the third part, each variable's set data for the preselected markets are compiled (see Table 1), all of this until complete each factor with the specific sources previously pointed in Figure 2.

According to Table 1, all the factors and their variables for each country and potential market are completed, considering the sources previously indicated and consulted on the internet.

This way, all this compiled data is analyzed and normalized with Equation 9, as shown in Table 2 below. Likewise, each variable is processed depending on whether they are directly or inversely proportional.

Consequently, Table 2 presents the normalization for each value obtained for the variables of all considered markets. In other words, the original values are customized with Equation 9 as values scaling from one to five, and the last number indicates the best rating.

According to Table 3, the next section presents the obtained results for each factor and each country or potential market after pondering all variable weights.

Finally, Table 3 shows the values obtained in all this assignment to complete the IMS's process. According to this hybrid multicriteria technique, the best options are Ireland, Netherlands, Denmark, and United Kingdom, taking into account the preselected countries that obtained the highest scores, respectively.

Table 1
Compilation of variable's set data for the preselected markets

	1	2	3	4	5	6	7	8	9	10
Factor weight										
Variable	United States	Germany	United Kingdom	Canada	France	Netherlands	Belgium	China	Sweden	South Korea
Variable weight										
Factor										
Trade barriers	(INOF)* 25.09%	73.50	79.30	78.20	66.00	77.00	68.90	59.50	74.90	74.00
	(TABS)** 24.45%	0.10	0.10	0.10	0.10	0.10	0.10	1000	0.10	8.00
	(NTBS)** 23.94%	3.50	6.50	4.30	6.50	6.50	6.50	7.00	6.50	1.20
	(PRIG)** 18.24%	716.00	644.00	530.00	689.00	589.00	542.00	1962.00	506.00	706.00
	(INCO)** 8.28%	83.70	81.20	79.60	78.80	82.40	76.40	73.90	81.20	79.60
	(RCRI)** 39.14%	1.00	1.20	1.00	1.90	1.10	0.90	1.70	2.00	1.50
Economics										
	(PIBP)* 23.02%	62.89	42.96	46.23	41.47	53.02	47.47	9.77	54.65	31.38
	(COL)* 19.97%	71.05	67.28	67.62	74.14	73.75	71.78	40.04	69.85	78.18
	(UNRA)** 17.88%	3.70	3.90	5.60	8.40	3.20	5.60	4.30	6.50	4.10
	(TAMP)* 36.02%	1.19	1.24	1.21	1.42	0.89	1.58	1.54	2.26	1.07
	(CIBC)** 22.49%	1750.00	0.10	172.00	0.10	0.10	0.10	241.00	0.10	315.00
Costs										
	(OFER)** 20.97%	1000.00	0.89	1327.00	0.89	0.89	0.89	6908.00	9458.00	1165.00
	(INTC)** 11.96%	1401.67	1637.88	1622.14	1982.62	1622.14	1622.14	1134.35	1890.26	1455.21
	(INTR)** 8.56%	1067.77	1067.77	440.73	1067.77	1067.77	1067.77	440.73	1067.77	440.73

(continue)

Table 1 (continuation)
Compilation of variable's set data for the preselected markets

	1	2	3	4	5	6	7	8	9	10
Factor weight	United States	Germany	United Kingdom	Canada	France	Netherlands	Belgium	China	Sweden	South Korea
Variable										
Variable weight	82.75	78.90	82.65	79.26	77.29	76.04	73.95	73.64	81.27	84.14
(EADB)*	31.44%									
(CUD)**	1300	36.00	25.00	3.00	5900	1.00	110.00	1300	5300	11.00
(COPI)*	6900	80.00	77.00	77.00	6900	82.00	75.00	41.00	85.00	59.00
(GLBI)*	82.54	88.69	89.97	84.74	87.40	91.19	90.69	65.11	90.15	79.34
(LOPI)*	389	4.20	3.99	3.73	3.84	4.02	4.04	361	405	361
(TRTI)**	700	20.00	18.00	10.00	18.00	1900	1900	3700	21.00	34.00
(FREC)*	800	8.00	8.00	8.00	8.00	800	800	800	800	800
(GELI)**	376	2.43	3.30	3.03	2.37	7.35	2.79	14.41	2.20	308
(GED)**	8837.00	11437.00	10281.00	13815.60	9940.29	10896.39	10624.13	25030.31	12606.01	25386.00
Factor	(continue)									
Cultural environment	14.43%									
Logistics	11.27%									

Table 1 (continuation)
Compilation of variable's set data for the preselected markets

Factor	Factor weight	Variable	Variable weight	11	12	13	14	15	16	17	18	19	20	
Trade barriers	29.99%	(INOF)*	25.09%	69.10	62.40	82.60	61.00	6380	66.90	73.30	78.30	80.90	73.30	
		(TABS)**	24.45%	6.50	7.25	5.00	0.10	0.10	0.10	0.10	0.10	0.10	0.10	20.00
		(NTBS)**	23.94%	6.50	6.30	3.70	4.20	6.50	6.50	6.50	6.50	6.50	6.50	3.30
		(PRIG)**	18.24%	54900	25300	42900	43200	71100	60300	47000	39500	36000	62900	62900
Economics	22.27%	(INCO)**	8.28%	6890	70.00	78.70	66.70	71.50	75.30	76.60	81.20	71.50	82.30	
		(RCRI)**	39.14%	300	2.80	1.00	2.00	1.80	1.50	1.10	1.00	0.40	0.60	
		(PIBP)*	23.02%	1542	23.34	57.40	11.29	34.49	30.32	51.50	61.39	78.58	39.29	
		(COLJ)*	19.97%	4004	48.34	73.54	39.21	67.26	53.77	70.38	83.00	75.91	83.35	
Costs	22.04%	(UNRA)**	17.88%	3.50	5.90	5.30	4.60	9.90	14.00	4.70	4.90	4.90	2.30	
		(TAMP)*	36.02%	0.41	1.33	2.00	2.26	0.91	0.79	0.57	2.27	1.14	1.80	
		(CIBC)**	22.49%	0.10	465.00	539.00	520.00	0.10	0.10	0.10	0.10	0.10	253.00	315.00
		(OFER)**	20.97%	383900	375.00	143900	64738.00	0.89	0.89	0.89	666900	0.89	10901.00	
		(INTC)**	11.96%	1890.26	2532.50	1904.67	1145.04	2263.71	2041.49	1637.88	1685.11	1145.04		
		(INTR)**	8.56%	1067.77	1067.77	440.73	1067.77	1067.77	1067.77	1067.77	1067.77	1067.77	440.73	

(continue)

Table 1 (conclusion)
Compilation of variable's set data for the preselected markets

Factor	Factor weight	Variable	Variable weight	11	12	13	14	15	16	17	18	19	20	
Cultural environment	14.43%	(EADB)*	31.44%	76.95	63.50	80.13	77.37	72.56	77.68	78.57	84.64	78.91	75.65	
		(CUD)**	26.71%	32.00	28.00	12.00	44.00	42.00	8.00	8.00	18.00	84.00	30.00	97.00
		(GLB)*	19.17%	81.50	66.10	82.05	72.57	83.37	83.37	85.84	89.09	89.28	84.56	78.81
		(GLB)*	19.17%	81.50	66.10	82.05	72.57	83.37	83.37	85.84	89.09	89.28	84.56	78.81
		(LOPI)*	29.12%	3.54	3.01	3.75	2.76	3.74	3.83	3.83	4.03	3.99	3.51	4.03
Logistics	11.27%	(TRTI)**	20.96%	21.00	28.00	35.00	24.00	23.00	18.00	20.00	20.00	17.00	34.00	
		(FREC)*	18.85%	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
		(GEL)**	17.79%	2.97	1.04	4.49	3.52	4.57	3.46	3.46	2.87	2.65	4.37	9.19
		(GED)**	13.28%	12706.92	18218.16	32570.63	20084.54	11535.05	8698.26	11666.01	11672.55	9593.24	25329.81	

Source: Elaborated by the authors.

* Directly proportional value (DPV).

** Inversely proportional value (IPV).

Table 2
Normalization of variable's set data for the preselected markets

Factor	Factor weight	Variable	Variable weight	1	2	3	4	5	6	7	8	9	10
				United States	Germany	United Kingdom	Canada	France	Netherlands	Belgium	China	Sweden	South Korea
Trade barriers	29.99%	(INOF)	25.09%	4.64	4.45	4.80	4.73	4.00	4.66	4.17	3.60	4.53	4.48
		(TABS)	24.45%	5.00	5.00	5.00	5.00	5.00	5.00	5.00	0.05	5.00	0.06
		(NTBS)	23.94%	1.71	0.92	0.92	1.40	0.92	0.92	0.92	0.86	0.92	5.00
		(PRIG)	18.24%	1.77	1.59	1.96	2.39	1.84	2.15	2.33	0.64	2.50	1.79
		(INCO)	8.28%	3.98	4.07	4.11	4.19	4.23	4.05	4.37	4.51	4.11	4.19
Economics	22.27%	(RCRI)	39.14%	2.00	1.67	2.00	2.50	1.05	1.82	2.22	1.18	1.00	1.33
		(PIBP)	23.02%	4.00	3.03	2.73	2.94	2.64	3.37	3.02	0.62	3.48	2.00
		(COLI)	19.97%	4.26	3.91	4.04	4.06	4.45	4.42	4.31	2.40	4.19	4.69
		(UNRA)	17.88%	3.11	3.83	2.95	2.05	1.37	3.59	2.05	2.67	1.77	2.80
Costs	22.04%	(TAMP)	36.02%	2.62	2.73	2.67	2.20	3.13	1.96	3.48	3.39	4.98	2.36
		(CIBC)	22.49%	0.00	5.00	5.00	0.00	5.00	5.00	5.00	0.00	5.00	0.00
		(OFER)	20.97%	0.00	4.38	5.00	0.00	4.38	4.38	4.38	0.00	0.00	0.00
		(INTC)	11.96%	4.05	3.46	3.50	3.94	2.86	3.50	3.50	5.00	3.00	3.90
		(INTR)	8.56%	2.06	2.06	2.06	5.00	2.06	2.06	2.06	5.00	2.06	5.00
Cultural environment	14.43%	(EADB)	31.44%	4.89	4.66	4.88	4.68	4.57	4.49	4.37	4.35	4.80	4.97
		(CUDI)	26.71%	0.38	0.14	0.20	1.67	0.08	5.00	0.05	0.38	0.09	0.45
		(GLBI)	22.67%	3.92	4.55	4.38	4.38	3.92	4.66	4.26	2.33	4.83	3.35
		(COPI)	19.17%	4.53	4.86	4.93	4.65	4.79	5.00	4.97	3.57	4.94	4.35
Logistics	11.27%	(LOPI)	29.12%	4.63	5.00	4.75	4.44	4.57	4.79	4.81	4.30	4.82	4.30
		(TRTI)	20.96%	5.00	1.75	1.94	3.50	1.94	1.03	1.84	0.95	1.67	1.03
		(FREC)	18.85%	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
		(GELO)	17.79%	1.38	2.14	1.58	1.72	2.19	0.71	1.86	0.36	2.36	1.69
		(GEDI)	13.28%	4.92	3.80	4.23	3.15	4.38	3.99	4.09	1.74	3.45	1.71

(continue)

Table 2 (conclusion)

Normalization of variable's set data for the preselected markets

Factor	Factor weight	Variable	Variable weight	11	12	13	14	15	16	17	18	19	20	
				Poland	Saudi Arabia	Australia	Russia	Italy	Spain	Austria	Denmark	Ireland	Japan	
Trade barriers	29.99%	(INOF)	25.09%	4.18	3.78	5.00	3.69	3.86	4.05	4.44	4.74	4.90	4.44	
		(TABS)	24.45%	0.08	0.07	0.10	5.00	5.00	5.00	5.00	5.00	5.00	5.00	0.03
		(NTBS)	23.94%	0.92	0.95	1.62	1.43	0.92	0.92	0.92	0.92	0.92	0.92	1.82
		(PRIG)	18.24%	2.30	5.00	2.95	2.93	1.78	2.10	2.69	3.20	3.51	2.01	
		(INCO)	8.28%	4.84	4.76	4.24	5.00	4.66	4.43	4.35	4.11	4.66	4.05	
Economics	22.27%	(RCRI)	39.14%	0.67	0.71	2.00	1.00	1.11	1.33	1.82	2.00	5.00	3.33	
		(PIBP)	23.02%	0.98	1.49	3.65	0.72	2.19	1.93	3.28	3.91	5.00	2.50	
		(COLI)	19.97%	2.40	2.90	4.41	2.35	4.03	3.23	4.22	4.98	4.55	5.00	
		(UNRA)	17.88%	3.29	1.95	2.17	2.50	1.16	0.82	2.45	2.35	2.35	5.00	
Costs	22.04%	(TAMP)	36.02%	0.90	2.93	4.41	4.98	2.00	1.74	1.26	5.00	2.51	3.96	
		(CIBC)	22.49%	5.00	0.00	0.00	0.00	5.00	5.00	5.00	5.00	0.00	0.00	
		(OFER)	20.97%	0.00	0.01	0.00	0.00	4.38	4.38	4.38	0.00	4.38	0.00	
		(INTC)	11.96%	3.00	2.24	2.98	4.95	2.51	2.78	3.46	3.37	3.37	4.95	
		(INTR)	8.56%	2.06	2.06	5.00	2.06	2.06	2.06	2.06	2.06	2.06	5.00	
Cultural environment	14.43%	(EADB)	31.44%	4.55	3.75	4.73	4.57	4.29	4.59	4.64	5.00	4.66	4.47	
		(CUDI)	26.71%	0.16	0.18	0.42	0.11	0.12	0.63	0.28	0.06	0.17	0.05	
		(GLBI)	22.67%	3.30	3.01	4.38	1.59	3.01	3.52	4.38	5.00	4.20	4.15	
		(COPI)	19.17%	4.47	3.62	4.50	0.07	4.57	4.71	4.88	3.98	4.64	4.32	
Logistics	11.27%	(LOPI)	29.12%	4.21	3.58	4.46	3.29	4.45	4.56	4.80	4.75	4.18	4.80	
		(TRTI)	20.96%	1.67	1.25	1.00	1.46	1.52	1.94	1.75	1.75	2.06	1.03	
		(FREC)	18.85%	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
		(GELO)	17.79%	1.75	5.00	1.16	1.48	1.14	1.50	1.81	1.96	1.19	0.57	
		(GEDI)	13.28%	3.42	2.39	1.34	2.17	3.77	5.00	3.73	3.73	4.53	1.72	

Source: Elaborated by the authors.

Table 3
Score for the preselected markets and recognition of the best markets for exporting

	19	6	18	3	7	2	9	17	5	1	4	16	15	20	13	10	14	11	12	8
Factor	Ireland	Netherlands	Denmark	United Kingdom	Belgium	Germany	Sweden	Austria	France	United States	Canada	Spain	Italy	Japan	Australia	South Korea	Russia	Poland	Saudi Arabia	China
Total factor weight																				
Trade barriers	3.70	3.34	3.56	3.35	3.28	3.19	3.38	3.41	3.13	3.45	3.53	3.21	3.12	2.26	2.56	3.01	3.44	2.11	2.50	1.61
Economics	4.44	3.01	3.10	2.75	2.79	2.82	2.34	2.75	2.15	3.11	2.83	1.76	1.95	3.77	2.89	2.42	1.47	1.55	1.55	1.56
Costs	2.40	3.34	3.50	3.73	3.89	3.62	3.45	3.09	3.69	1.61	1.69	3.18	3.24	2.45	2.37	1.74	2.56	1.99	1.50	2.25
Cultural environment	3.35	4.76	3.48	3.53	3.31	3.47	3.58	3.46	3.27	3.40	3.80	3.31	2.94	3.19	3.45	3.28	1.84	3.08	2.60	2.68

(continue)

Table 3 (conclusion)
Score for the preselected markets and recognition of the best markets for exporting

	19	6	18	3	7	2	9	17	5	1	4	13	10	14	11	12	8
Factor																	
Logistics	3.40	3.21	3.54	3.58	3.60	3.65	3.57	3.52	3.65	4.24	3.69	2.84	2.94	2.76	3.29	3.45	2.69
Total accumulated score	3.49	3.46	3.43	3.35	3.35	3.29	3.22	3.21	3.11	3.05	3.03	2.75	2.63	2.50	2.23	2.19	2.02
Total factor weight	11.27%																

← Best option for exporting

Source: Elaborated by the authors.

CONCLUSIONS

The approach adopted in this paper can be a handy tool for any kind of enterprise that pursues the best options of the export market to direct their products to. In this study, the current hybrid multicriteria technique for IMS based on AHP promotes foreign markets' recognition based on easily accessible and official information, facilitating rigorous decision making. This allows reducing the uncertainty that often represents companies' internationalization without data to support a specific market's choice.

Likewise, this technique considers different factors and variables that, according to the current literature, directly impact the choice of an international market. For this purpose, it is necessary to know the experts' perceptions (analysts, supervisors, coordinators, and directors) in charge of the company's foreign trade department used as the object of study. Thereby, their experience will reflect each factor's hierarchy and each variable, given that each type of company and each type of product may involve different weightings. It is precisely at this point that the AHP methodology's relevance as a complement to the IMS technique emulated in this article is highlighted.

It is possible to remark that the availability of official data on the internet offers outstanding opportunities for enterprises that intend to enter foreign markets. This way, the pointed sources allow analyzing markets according to their international demand. Likewise, the entire sources from all factors and variables considered in this study reflect each preselected country's economic, political, and social behavior – that is why this technique rationalizes the IMS process leaving apart the recurrent absence of statistical support.

It should be noted that the results discussed here are limited to the considered preselected markets and the factors and variables indicated in the emulated technique even though the globalization dynamic and the international trade cannot ignore, at the time, the potential new factors and variables that firms can include in this approach according to new realities in business practices.

Lastly, the hybrid multicriteria technique for IMS based on AHP adopted in this article should be applied to other enterprises types, in order to consolidate the understanding on this matter, contributing to continuously increase the academic and scientific knowledge of the community who participate in international business decision making.

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