The decision process for the International Markets Selection:

A fuzzy model application to a small firm case

Gianluca Marchi[a], Marina Vignola[b], Gisella Facchinetti[c], Giovanni Mastroleo[d]

[a] Università degli studi di Modena e Reggio Emilia - Facoltà di Economia Marco Biagi, Viale Berengario, 51 – 41110 ModenaTel. 059 2056864, e-mail: gianluca.marchi@unimore.it
[b] Università degli studi di Modena e Reggio Emilia - Facoltà di Economia Marco Biagi, Viale Berengario, 51 – 41110 Modena, Tel. 059 2056810, e-mail: marina.vignola @unimore.it
[c] Università degli studi di Modena e Reggio Emilia - Facoltà di Economia Marco Biagi, Viale Berengario, 51 – 41110 Modena, Tel. 059 2056779, e-mail: gisella.facchinetti@unimore.it
[d] Università degli Studi della Calabria - Facoltà di Economia, Ponte Pietro Bucci, 87036 Arcavacata di Rende (CS), Tel. 0984 492242, e-mail: mastroleo@unical.it

Abstract

The international marketing literature shows different models which give interesting but partial contributions to the problem of International Markets Selection. In this study, a new model is proposed to evaluate the attractiveness and the accessibility of potential foreign markets. We attempt to hybridize the formal rigour of normative approaches based on the multi-criteria analysis with the attitude of the behavioural approaches to take into consideration the firm's strategic orientation and the managerial experiential knowledge. The model, based on a Fuzzy Expert System (FES), is tested and validated through an application to the foreign markets' choice problem of a small industrial firm. Then, main results, managerial implications and limitations are discussed.

Keywords: International markets selection; Internationalisation process; Decision process; Small firm; Expert system; Fuzzy logic

1. Introduction

The International Markets Selection is a critical issue in the definition of foreign entry strategy (Papadopoulos et al., 2002). The cultural, political, economical, and institutional dissimilarities existing throughout the country markets (Johanson and Valne, 1977, 1990) make this decision really complex and difficult to take, in particular for the Small Medium Enterprises (SMEs) with lower competencies about foreign markets (Papadopoulos, 1987).

Two main approaches are proposed by literature (Brewer, 2001). In the International Marketing Selection (IMS) approach, the decision process is highly formalized and structured along a sequence of steps. The search for information is extensive and market data are extracted from secondary sources. In Internationalisation Process(IP)-based selection models, the IMS decision process is decomposed and simplified to limit the complexity and uncertainty of the decision context.

Although many scholars had intensely worked on these topics in the past (Papadopoulos and Denis, 1988), both approaches revealed many inadequacies. The greatest difficulties were encountered in extending the application of the proposed models to different sectors (Cavusgil, 1985; Douglas and Craig, 1992; Papadopoulos et al., 2002) and different firm sizes. Separately considered, therefore, both approaches don't really give a satisfying solution to the foreign markets selection problem.

This problem is particularly difficult to face in small firms, where the strategic decisions are often embedded in the entrepreneur's cognitive models and practices. Therefore, also the process used to assess and select foreign markets has to be

sufficiently aligned with the entrepreneur's mind and his/her usual preference for loosely defined and flexible decision frames.

In this paper we propose and test a model for the international markets selection more suitable for small firms and for relatively unstructed decision contexts. We try to integrate the strategic and experiential dimension of the IP-based approaches into a more formalized IMS model by adopting a multi-criteria ranking approach which includes both quantitative market data and firm's perceptual variables. A Fuzzy Expert System (FES) is used to obtain the foreign maket evaluation (Von Altrock, 1997).

In the next Section the theoretical framework on international markets selection is briefly outlined. The research design, the methodology, and the criteria used for the FES model development and implementation in a small firm case are then presented (Section 3). In Section 4 the main findings are shown and discussed. Finally, the managerial implications are examined (Section 5) before drawing some conclusive remarks (Section 6).

2. The theoretical framework

The International Markets Selection is a critical issue in the foreign entry strategy, given its influence on the entry mode's choice, export performance, and competitive positioning (Papadopoulos and Denis, 1988; Kumar et al., 1994). The two main approaches proposed by literature are (Brewer, 2001): a) the International Marketing Selection (IMS) approach and b) the Internationalisation Process (IP)-based approach.

a) Drawing from normative studies on managerial decision processes (Bazerman, 2001), in the IMS approach the decision model is highly formalized and structured along a sequence of steps (definition of objectives; definition of a whole set of alternative solutions; identification and weight of variables to be used; evaluation and selection of the best solution). The search for information is extensive and market data are extracted from secondary sources.

Within this approach, the market selection problem has been faced by adopting two different classes of applied quantitative methods: the clustering approach (Cavusgil, 1985) and the ranking approach (Papadopoulos et al., 2002). The latter is grounded on more complex multicriteria settings based both on attractiveness and demand-related variables, and on accessibility and entry barrier variables. In literature, it is argued that the ranking methods allows a more balanced trade off between costs, risks, and opportunities related to markets, so leading to more purposeful decisions (Papadopoulos and Denis, 1988; Kumar et al., 1994).

Because of the complexity required to carry out a detailed quantitative analysis simultaneously on roughly 200 country markets, ranking approaches are often rooted in multi-step screening models (Cavusgil, 1985; Williamson et al., 2006). At the preliminary stage, through the adoption of simple filtering "go / no go" macro-variables (i.e., GNP per capita, product quotas), the low-ranked countries are removed from the analysis (Papadopoulos and Denis, 1988). During the following steps, the remaining country markets are submitted to attractiveness and accessibility tests based on a set of industry-specific variables (market size and growth rate; competitive structure; customer behavior; socio-political, normative, and economic

system; country risk; distribution channels and market infrastructures; entry barriers, etc.) (Douglas et al., 1982; Cavusgil, 1985; Papadopoulos et al., 2002). At the final step, the few skimmed markets are analysed at a firm-specific level, focussing on more product-specific market potentials and costs needed for product adaptation. While, in the earlier steps, the analysis is grounded mainly on secondary data sources, the final screening stage requires ad-hoc field researches (Cavusgil, 1985).

b) The Swedish School faces the international markets selection problem using modes and procedures consistent with the overall IP approach (Johanson and Vahlne, 1977; 1990). The psychic distance becomes the core construct for markets selection models: when there's only a small amount of knowledge about international markets and uncertainty prevails, as typically observed in the early internationalisation stages, the decision makers tend to assign the enter priority to those country markets which are perceived as less distant to the home country (Johanson and Vahlne, 1977, 1990; Forsgren and Johanson, 1992).

According to the behavioural approaches, the decision process is decomposed and simplified to limit its complexity and uncertainty. To reduce the cognitive effort, the decision maker seeks just one satisfying solution out of a limited set of them, by applying established heuristics of judgment and choice (Kahneman et al., 1982; Payne et al., 1993) and non compensatory strategies (Rumiati and Bonini, 2001): e.g., the firm initially enters the markets where the psychic distance is shorter or where the first unsolicited orders are received from, or where competitors are already present (Papadopoulos, 1987; Douglas and Craig, 1992). Rather than gathering and analyzing market data through formal systems, the IP-based models are founded on

manager's experiential knowledge acquired by observing, "in the international field", the behaviours of the leading firms (Bonaccorsi, 1992; Forsgren 2002), and through the ability to learn by interacting within business networks (with suppliers, customers, distributors) (Johanson and Mattson, 1986; 1988; Johanson and Vahlne, 1990; Forsgren, 2002; Blomstermo et al, 2004). As the manager's knowledge on specific markets increases, uncertainty diminishes as well as his/her perception of psychic distance (Cavusgil, 1985; Chetty and Blankemburg Holm, 2000; Chetty and Cambell-Hunt, 2003). Moreover, in the IP-based models the firm's strategic orientation is explicitly taken into consideration (Papadopoulos, 1987; Kumar et al., 1994) through the elicitation of managerial beliefs. So, different firm's strategic aims, resource bases, and development strategies can lead to different outcomes in the attractiveness/accessibility analysis.

The main characteristics of the two approaches are outlined in Table 1.

Table 1 – Main characteristics of two main ISM approaches

Main characteristics	IMS approach	IP-based approach
Decision process	Structured in sequential steps	Research of solution by stage (Simon, 1983; 1987) using heuristics of judgment and choice (Kahneman et al., 1982; Payne et al., 1993)
Search for information	Extensive (total set of market variables)	Limited
Market data	Objective; secondary sources	Subjective; experiential and network knowledge (Johanson and Vahlne, 1977; 1990; Johanson and Mattson, 1986; 1988; Forsgren and Johanson, 1992)
Market selection	Quantitative models - clustering approach (Cavusgil et al., 2004); - ranking approach (Papadopoulos et al. 2002)	Gradual approach (Johanson e Vahlne, 1977; 1990); heuristic of choice (psychic distance, unsolicited orders, imitation others firms …)
Role of strategic and experiential dimension	Absent (Papadopoulos, 1987; Kumar et al., 1994)	Taken into consideration (Papadopoulos, 1987; Kumar et al., 1994)

Several criticisms were made to both approaches. The IMS models suffer greatly from its narrow prescriptive nature (Simon, 1983, 1987; Arrow, 1986; Kahneman et

al., 1982; Sakarya et al., 2007). None of the normative approaches offers a reasonable complete solution to the markets selection problem. There is no consensus about the complete set of variables to be used to measure market attractiveness and accessibility and about their relative weights within multi-criteria settings (Papadopoulos and Denis, 1988). Furthermore, secondary data collection problems frequently arise. Finally, they don't take into account firm's strategic orientation in the selection and evaluation of the information (Kumar et al., 1994; Papadopoulos et al., 2002).

On the other side, the IP-based methods (each of one is modeled on a single decision maker's structure of beliefs) were charged with the risk of cognitive distortions in problem formulation, data acquisition, judgement and choice (Kumar et al., 1994; Rumiati and Bonini, 2001). For instance, the choice to enter a less psychic-distant market may imply to neglect more attractive markets. Moreover, the main limitation of the IP-based model is the absence of any formalization and empirical validation of the proposed process.

The main traits and limitations of the two approaches can be interestingly discussed in relation to their application to different firm sizes. The IMS models are more appropriate as decision support systems for larger firms, with greater managerial structures, more complex information systems, and higher amounts of resources formally employed in market research. Small firms normally do not use so systematic approaches to the decision process (Papadopoulos, 1987; Brouthers and Nakos, 2005; Alexander and Rhodes, 2007). The knowledge relevant for strategic decisions is often embedded in the entrepreneur's cognitive models and practices.

Therefore, also the process used to assess and select foreign markets has to be sufficiently aligned with the entrepreneur's overall decision making strategy. Too rigidly structured procedural schemes, in fact, may not be suitable for the entrepreneur's loosely defined and flexible decision frames. As for this trait, the IP-based models seem more appropriate for small firms, that employ more informal and unstructured methods due to the extant difficulties in managing extended data collection and complex analysis. However, the small firm's preference for more unstructured decision models and simple heuristics increases the risk of cognitive distortions. Thus, the markets selection process has to be structured enough to compel the decision makers to take into consideration a larger set of variables than those usually assessed. As well, the international markets selection decision process must be appropriately configured to absorb and exploit the experiential knowledge accumulated by the entrepreneurial team. This means that the decision model must support the small firm's management in the process of articulation and codification of tacit knowledge by means of linguistic attributes.

As the two main approaches proposed by literature, if considered as rigid alternatives, don't give a satisfying solution to the foreign market selection problem, the purpose of this study is to build and test, in a small firm setting, a new model of international markets selection which hybridizes the strategic and experiential dimension of IP-based approaches with the more formalized IMS processes (Papadoupolos et al., 2002).

Thus, we can formulate the research questions (RQ) as follows:

RQ1: is it possible to develop a formal model for international market selection apt to be used in loosely structured decision frames and when no clearly defined underlying datasets exist, as typically occurs in small firms? Is it possible to conceive a model that compels the decision maker to consider the whole set of variables highly relevant for the problem solution, so reducing the risk of cognitive distortions?

RQ2: is it possible to develop a more formal model in which the requisite of flexibility is preserved, as typically occurs in more unstructured decision process?

RQ3: is it possible to capture and codify the experiential knowledge and the strategic aims of the decision maker, and to transfer it into the structure of a fuzzy tree-shaped decision scheme?

3. The research design

3.1 Overall Design

Having these objectives in mind, the overall research design has been structured for the purpose to test a three-step screening model (based on ranking approach) that we propose for the foreign market selection (Table 2).

Table 2. A three-step screening method of foreign markets selection.

SELECTION MODEL STEPS	SOURCES AND ACTORS INVOLVED	OUTPUT OF THE SELECTION MODEL
a) preliminary screening	Secondary sources; Manager interview; System designer and research team	43 countries selected out of 200
b) the fuzzy analysis	Secondary sources; Firm's archival data; Manager interviews; System designer and research team	ranking of 43 foreign markets
c) the final decision	Manager evaluation	one market selected out of the top-ranked countries

As the development and test of the model requires a strong interaction with the user, the research has been conducted on a small Italian manufacturing firm.

At the early step, a first preliminary selection of markets to be analysed has been carried out. Following the literature suggestions (Cavusgil et al., 2004), by applying a non compensatory lexicographic rule, we selected a variable to discriminate among roughly 200 country markets.

At the second stage, we assessed the attractiveness and accessibility of markets selected through the preliminary step. In accord with the research questions, we derived the identification of the variables to be included in the model both from literature and research team's opinion and from the firm's experiential knowledge and strategic orientation. The evaluation method is based on the idea - not so common in the literature - that these two macro-indexes can be fruitfully analysed by combining objective and perceptual factors. The objective factors are measured by means of secondary statistical sources. The perceptual factors (collected through direct interviews) are based on manager's perceptions formed on the basis of experiential knowledge and business relationships inside the international networks.

Then, to get a better structuraction of the decision model and reduce the risk of cognitive distortions and informational holes, we instructed an expert system decision setting, based on a multi-criteria approach able to compute both qualitative and quantitative variables. An expert system is a computer-supported evaluating system that reproduces the decision rules of a human expert (Gillies, 1998), with the aim to reduce inferential errors. It seems particularly appropriate for giving solutions to badly structured decision problems and with no clearly defined underlying datasets

(Cammarata, 1994; Rossignoli, 1997; Turban and Aronson, 2002), as typically occurs in small firms. The expert's knowledge basis on data and procedures (that is, heuristic rules used to apply knowledge in problem framing and solution) is codified and stored in the memory system (Turban and Aronson, 2002). The codification process is based on the interaction between the expert (who is both the co-developer and the user of the system) and the knowledge system designer, who helps the expert to map the decision process and to elicit his/her tacit knowledge.

When data provided by the user are vague or incomplete and the decision frame is unstructured, and even a satisfying solution is acceptable, it seems particularly helpful to use a Fuzzy Expert System (FES) (Zadeh, 1965)[1]. A FES is an expert system to which a fuzzy logic is applied. This logic is based on the fact that a concept is not only "true" or "false", as expected by the classic boolean logic. But it can be "true" or "false" in a continuum, with infinite levels of truth included in a range from 0 to 1. The level of truth is represented by the "membership function" (*m(A,x)*), (Cammarata, 1994; Bojadziev and Bojadziev, 1997). More concepts in the real-life are fuzzy, that is they are not really true and not really false. Concepts like high, low, hot, new, and so on, are fuzzy concepts: they are vague, unclear (Kosko, 1995). The characteristics of a FES fit well to the research questions and the proposed methodology. In fact, a FES is able to describe linguistically a particular phenomenon or process. So, we built a fuzzy-based multicriteria model which includes both quantitative market data and firm's perceptual variables, including data related to the firm's strategic orientation. A ranking of top country markets was so

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[1] For other applications of fuzzy logic to international business studies, see Chou et al. (2008) and Ou and Chou (2009).

produced. Afterwards, the model output was assessed and validated by the firm's management.

Finally, at the third screening step, the management selected one single market as the first enter priority out of the more numerous set of top ranked countries.

3.2 The firm's profile

In order to develop and test the international markets selection decision model, an Italian small manufacturing firm (2 mln. € in yearly sales; 13 employees) has been selected as research partner. The company is active in the stationery industry, with a high quality and high price product addressed to market niches (students and 20-30ys aged people).

Some specific characteristics made this firm particularly suitable for this research.

First of all, the entrepreneur was highly committed to the research issue. The selection of foreign markets was a managerial problem that the firm was really facing during the research period. After that for many years the international activity of the firm was limited to sporadic sales (unsolicited orders from a narrow group of foreign markets), the management expressed the intention to assume a more proactive approach to the international development (Brewer, 2001; Koch, 2001). The interest towards foreign markets arose in front of the deterioration of the competitive positioning at home: the impulse to grow in international markets emerged to counteract a market share decrease in Italian market and to assure a better level of utilisation of the production capacity. This led to a more clearcut formulation of the international strategies, so as to align the decision, first of all, to the strategic goals

and, then, to adapt it also to the organizational constraints. From a strategic point of view, the intention was to enter only niches in those countries similar to the home market, considered as the more appropriate to absorb the firm's standardised and high-priced product. From an organizational perspective, because of the scarcity of resources and the absence of a specific foreign market department, the intention was to invest only in one country, selected among those less distant to the domestic market. A gradual approach to international markets so did explicitly emerge. These aims notwithstanding, no formal international strategy was formulated by management till then. In particular, there was great uncertainty about the identification of the more appropriate country market assessment and selection model (which set of variables, which relationships between variables,…), especially for the purpose to choose the first country to enter.

Second, despite the low international sales, the entrepreneur had cumulated a certain amount of international experiential knowledge. Through the presence in international fairs and the ability to learn by interacting with foreign suppliers and buyers, he formed his initial knowledge bases on international markets, foreign competitors and consumers' behaviours, and distribution channels. For this reason, also thanks to his formal tertiary level education in business disciplines, he represented a proper subject to deal with in the research programme.

During all the research steps, the firm's management (and the entrepreneur in particular) worked at hand with the research group. As key informants, they supported the research by reconstructing the firm's strategic profile, resource map, product positioning, informational network externalities (Cavusgil, 1985), and

attitude to foreign markets. As co-developers, they participate to all the stages in the model construction (Papadopoulos and Denis, 1988; Kumar et al., 1994; Brewer, 2001), giving an experience-based contribution to the variables identification and the rules configuration. As users, they validated the model and finally took the decision to select one country as the first market to enter in their process of internationalisation.

3.3 Data collection method

Two main data collection strategies were used.

a) Market data collection from secondary sources (ONU; WTO; Istat; Eurostat; Doing Business). Data were gathered for all the 200 countries with regard to the threshold variable (GNP per capita). Then, for each countries selected after the first screening step, a larger set of variables was collected.

b) Knowledge acquisition from the firm's management. This is frequently a difficult task, as the manager may not be capable to describe in form of language all the elements of the decision process, even though he has much experiential knowledge about the problem (Gillies, 1998). Following Vandamme (1987), we structured the method to extract data from the expert as follows:

- we collected firm's archival data (internal reports), to understand the perceived product positioning and the main competitors' profiles;

- we held an in depth unstructured interview to the entrepreneur-manager in order to acquire more detailed information on the firm's past experiences in international activity, its attitude to foreign markets, and the future international strategy;

- we administered a series of structured questionnaires to collect manager's perceptions at the different stages of development of the decision model. Therefore, for each variable (and each country) to be examined, we measured the manager's perceptions about variables relevance in decision process (weight), causal relationships among variables, and variables evaluation.

As a whole, we held five interviews with two firm's key informants (entrepreneurs).

3.4 The model variables and measures

At the preliminary screening step, following literature and the manager's indications, we selected the GNP per capita as the variable used to discriminate among roughly 200 country markets. Only those markets that ranked above the Italian GNP per capita (the threshold value fixed by the firm) were considered for the following steps. At the second step, in order to measure the market attractiveness and accessibility (Tables 3 and 4), ten variables (left column) were included in the model, five objective and five perceptual variables, measured through twenty-one operational indicators (right column), thirteen based on secondary sources and eight coming from managerial perceptions. In some cases, variables are formed by some subvariables called factors (middle column). The whole set of attractiveness and accessibility variables, factors, and indicators is outlined in Tables 3 and 4.

The variables selection was based on the firm' specific product characteristics, market target, and internationalisation strategies. For example, the market objective attractiveness is a compounded variable (macro-variable) that comes from three variables: demand size, demand characteristics, and country risk. Demand

characteristics, in turn, is formed by two factors: country-of-origin effect and market similarity.

Tab. 3 – Objective variables, factors, and indicators

OBJECTIVE MARKET ATTRACTIVENESS		
Variables	**Factors**	**Indicators**
Demand size	Market potential (Population)	% population in the age 10-30 % university student
	Product demand	Apparent consumption (domestic production plus imports minus exports); trend consumption years 2002/2003
	Substitutive Product demand	Technologic products demand (ICT) [1000 PC per 10.000 inhabitants]
Demand Characteristics	Country of Origin effect (Made in Italy)	Made in Italy import (TCSHP) as % Total Import (TCSHP) TCSHP= Textile, clothing, shoe and home product
	Market Similarity	GNP/capita PPP
		Consumption propensity (apparent consumption/total consumption)
		HDI – Human development consumption
Country risk	Ease of Doing Business: Starting a Business; Dealing with Licenses; Hiring and Firing; Registering Property; Getting Credit; Protecting Investors; Paying Taxes; Trading Across Borders; Enforcing Contracts; Closing a Business	
OBJECTIVE MARKET ACCESSIBILITY		
Variables	**Indicators**	
Trade Barriers	Import penetration: Total import as % of total consumption	
	Tariffs Barriers (wood/paper)	
Geographic distance	km distance between Italy and target country	

Tab. 4 - Perceptual variables and indicators

PERCEPTUAL MARKET ATTRACTIVENESS	
Variables	**Indicators**
Imitation risk	Perception of imitation risk
Product superiority	Perception of superiority that foreign consumer could assign to firm's product
Product alignment	Perception of product alignment to the market needs (product standardization)
	Psychic distance
PERCEPTUAL MARKET ACCESSIBILITY	
Managerial skills	Level of Managerial skills in relation to the foreign market (linguistic, strategic and organizational skills)
Knowledge about target market (market risk)	Institutional and business experiential knowledge of the target market
	Embedded in a local network with foreign relationship: Role of the local network on the acquisition of potential market's information
	Market information from secondary data: Degree of the accessibility to the information from the secondary data regarding to the foreign potential market

The market similarity factor was selected having in mind the firm's preference for those foreing markets where the demand is quite similar to the home market. This is in line with the literature suggestion that similarity favours the implementation of

product standardization and decreases the risk perception (Koch, 2001; Robertson and Wood, 2001), and with the firm's strategic preference for a gradual approach to internationalisation. For the same reason, we introduced the country-of-origin effect factor (Papadopoulos et al. 2002). In the right column of Table 3, the operational indicators used for these two factors are outlined. The variable choice was also constrained by data collection issues, a usual limitation in many normative approaches to market selection. For instance, the market accessibility, normally evaluated considering three main variables (trade barriers, competitive barriers, and the market infrastructures), here was measured only using tariff barriers and geographical distance (Table 3). The lack of information from secondary sources was compensated by integrating perceptual variables into the model. For example, the market similarity variable, that was obiectively measured using as proxies the GNP per capita and the consumption propensity, was integrated by the manager's perception related to the firm's product appropriateness to foreign market needs and to the perceived psychical distance. Finally, other perceptual variables were added to the model with the aim to include the manager's experiential knowledge, generally neglected in the traditional normative approaches. For instance, as for market accessibility, the firm-related perceptual variables (managerial skills and knowledge about target markets) complete the informational value associated to objective indicators. This fits well also to literature suggestions about the relationship between specific market knowledge, uncertainty, and accessibility (Johanson and Vahlne, 1990; Forsgren and Johanson, 1992; Forsgren, 2002; Blomstermo et al, 2004; Chetty and Cambell-Hunt, 2003).
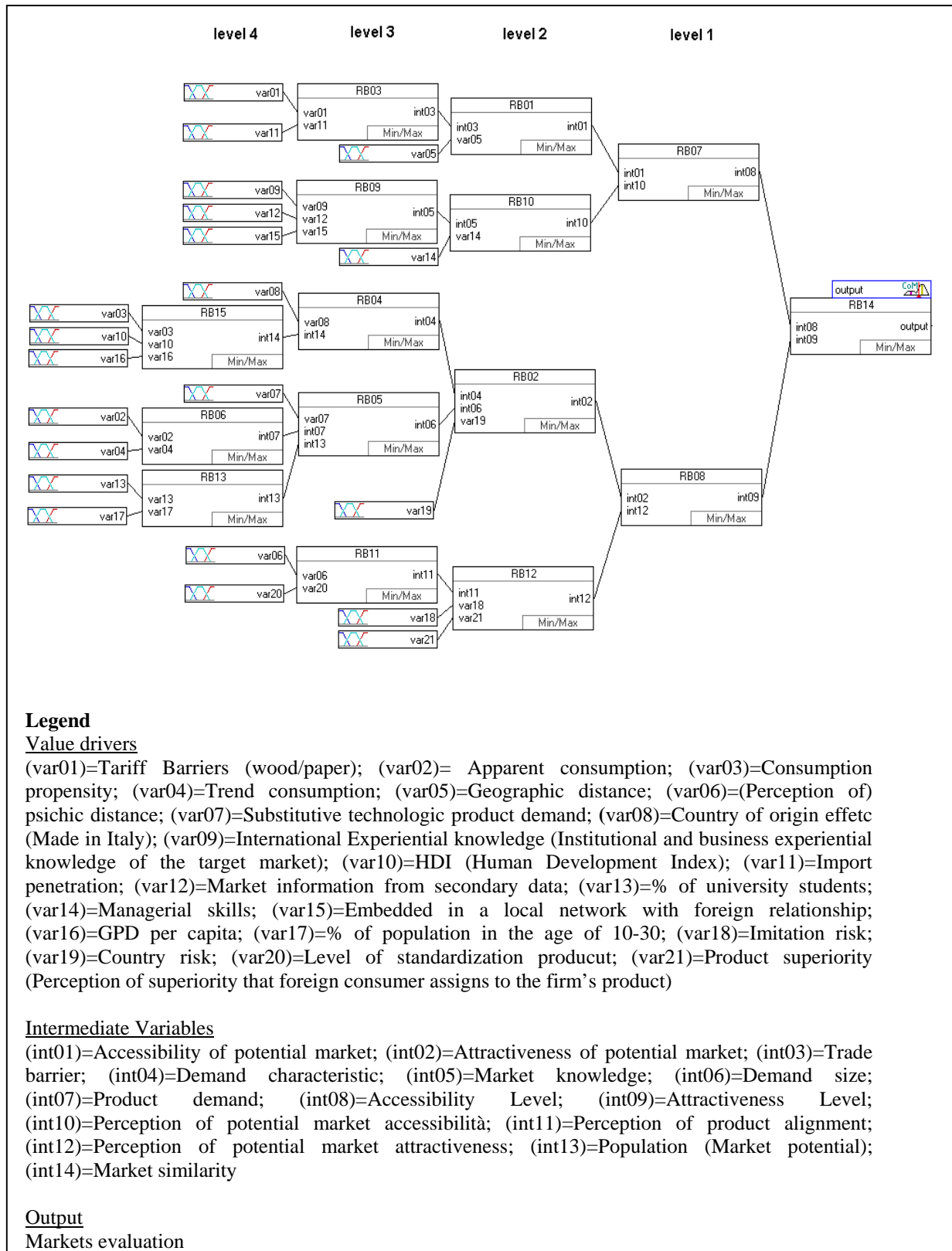
3.5. The Fuzzy model

By aggregating the 21 selected indicators (the value driver input of the decision process) into the more complex corresponding variables (intermediate output variables), the model takes the form of a tree, which reproduces how the expert uses the input data to obtain the final output. The final output is the overall evaluation of the country markets, that is directly related to the market attractiveness and the market accessibility (Figure 1). A modular system is so designed in the form of a Fuzzy Expert System (FES), that dramatically reduces the model complexity (Magni et al. 2004).

FES uses fuzzy data, fuzzy rules, and fuzzy inference, in addition to the standard ones implemented in the ordinary expert systems. In a FES, the knowledge is contained both in its rules and in fuzzy sets, which hold general description of the properties of the phenomenon under consideration.

Drawing from Von Altrock (1997), the main phases in the FES design are as follows:

- Identification of the problem and choice of the type of FES which best suits the problem requirement;

- Definition of input and intermediate output variables, their linguistic attributes (fuzzy values), their membership function (fuzzification of input and output), and their weights so as to measure the variables relevance in markets' assessment. For every input a variation range was assigned. Each variation range was broken up by the system designer in different zones through linguistic attributes, such as "low", "medium", "high" (Bojadziev and Bojadziev, 1997);

Fig. 1 - Model structure

level 4   level 3   level 2   level 1

var01

RB03
var01   int03
var11
Min/Max
var05

RB01
int03   int01
var05
Min/Max

RB07
int01   int08
int10
Min/Max

var11

var09

RB09
var09   int05
var12
var15
Min/Max
var14

RB10
int05   int10
var14
Min/Max

var12

var15

var08

RB04
var08   int04
int14
Min/Max

RB15
var03   int14
var10
var16

var03

var10

var16

var07

RB05
var07   int06
int07
int13
Min/Max

RB02
int04   int02
int06
var19
Min/Max

var02

RB06
var02   int07
var04
Min/Max

var04

var13

RB13
var13   int13
var17
Min/Max

var19

var17

var06

RB11
var06   int11
var20
Min/Max

RB12
int11   int12
var18
var21
Min/Max

RB08
int02   int09
int12
Min/Max

var20

var18

var21

output   CoM
RB14
int08   output
int09
Min/Max

Legend

Value drivers

(var01)=Tariff Barriers (wood/paper); (var02)= Apparent consumption; (var03)=Consumption propensity; (var04)=Trend consumption; (var05)=Geographic distance; (var06)=(Perception of) psichic distance; (var07)=Substitutive technologic product demand; (var08)=Country of origin effetc (Made in Italy); (var09)=International Experiential knowledge (Institutional and business experiential knowledge of the target market); (var10)=HDI (Human Development Index); (var11)=Import penetration; (var12)=Market information from secondary data; (var13)=% of university students; (var14)=Managerial skills; (var15)=Embedded in a local network with foreign relationship; (var16)=GPD per capita; (var17)=% of population in the age of 10-30; (var18)=Imitation risk; (var19)=Country risk; (var20)=Level of standardization producut; (var21)=Product superiority (Perception of superiority that foreign consumer assigns to the firm's product)

Intermediate Variables

(int01)=Accessibility of potential market; (int02)=Attractiveness of potential market; (int03)=Trade barrier; (int04)=Demand characteristic; (int05)=Market knowledge; (int06)=Demand size; (int07)=Product demand; (int08)=Accessibility Level; (int09)=Attractiveness Level; (int10)=Perception of potential market accessibilità; (int11)=Perception of product alignment; (int12)=Perception of potential market attractiveness; (int13)=Population (Market potential); (int14)=Market similarity

Output

Markets evaluation

- Definition of the set of heuristic fuzzy rules (IF-THEN rules), which connect the fuzzy input sets to the fuzzy output sets (Kosko, 1995; Cammarata, 1994);

- Choice of the fuzzy inference method (selection of aggregation operators);

- Data entering for selected variables from secondary sources and interviews;

- The FES is now ready to run. The final step is to implement the function and make the evaluation automatic. For each driver a specific value is selected (for the qualitative drivers the unit interval [0,1] is used). Via the block rules (i.e. the composing functions), the intermediate variables are reached and in turn activated, until the final value y is reached. Such a value is a number fuzzy (Magni et al., 2004);

- Translation of the fuzzy output in a crisp value (defuzzification methods);

- Validation test of the fuzzy system prototype, drawing of the goal function between input and output fuzzy variables, change of membership functions and fuzzy rules if necessary, tuning of the fuzzy system.

It's interesting to mention how the researchers faced the problem of weights evaluation, which is considered as one the more critical point in literature (Papadopoulos et al., 2002). In line with the proposed methodology, the variables weights were defined by managers. This allows to embody the strategic dimension in the decision process. For example, the fact that the market attractiveness variable was weighted more than the accessibility is consistent with a proactive approach to foreign markets.

4. Results and discussion

After that the preliminary screening test was run, 43 countries were selected. Then, the fuzzy model has been applied to these 43 countries. The FES output, measured as a crisp value within a [0, 100] range, takes the form of a country market ranking (Table 6).

Tab. 6 – Country markets: Top scores

Countries	OMAcces	PMAcces	LMAcces	OMAttratt	PMAttratt	LMAttratt	ME Score
Netherlands	0,844	1,000	0,896	0,595	0,800	0,726	**76,778**
Switzerland	1,000	0,960	0,965	0,609	0,750	0,707	**76,532**
Finland	0,642	1,000	0,761	0,761	0,850	0,802	**74,140**
Norway	0,680	0,960	0,787	0,730	0,850	0,802	**74,124**
Iceland	0,422	0,880	0,561	0,667	0,950	0,840	**73,040**
Belgium	0,885	0,950	0,881	0,618	0,700	0,670	**72,832**
Sweden	0,681	1,000	0,788	0,747	0,800	0,785	**72,794**
Austria	0,975	0,800	0,879	0,682	0,650	0,676	**72,296**
New Zealand	0,500	0,867	0,625	0,754	0,850	0,804	**71,780**
France	0,899	0,767	0,833	0,611	0,688	0,670	**70,688**
Denmark	0,755	0,960	0,804	0,641	0,750	0,726	**70,434**
Germany	0,869	0,771	0,818	0,641	0,536	0,623	**68,528**
Luxemburg	0,946	0,960	0,915	0,382	0,750	0,537	**67,666**
Slovenia	1,000	0,950	0,958	0,470	0,700	0,571	**66,818**
Canada	0,500	0,771	0,567	0,741	0,688	0,717	**64,194**
Utd. Kingdom	0,794	0,600	0,704	0,664	0,464	0,605	**63,852**
Australia	0,051	0,867	0,334	0,667	0,850	0,804	**61,790**

Legend: (OMAccess)= objective market accessibility; (PMAccess)=perceptual market accessibility; (LMAcces)= overall level market accessibility; (OMAttratt)=objective market actractiveness; (PMAttratt)= perceptual market actractiveness; (LMAttratt)= overall level market actractiveness; (MEScore) = Markets Evaluation Score

The final ranking was submitted to the firm's management (the entrepreneur) in order to be validated. Looking at the overall findings, it can be observed that the nine top scorer countries are all small but rich country markets. This finding is in line with the declared international strategy of the firm: to enter wealthy markets suitable to absorb quickly a premium product and to operate in a niche so as to avoid a direct competitive confrontation with local market leaders. The entrepreneur considered this outcome as highly relevant and consistent with his decision frame (RQ1). The fuzzy model demonstrated a quite good ability to assign high scores to countries that

are above the acceptability threshold in the manager's mind. Furthermore, the tree-shaped model helps the manager structure better his decision process by representing the whole set of relevant variables and the relationships among them. This is important because these variables are often not appropriately connected in the manager's mind, due for instance to the effect of conservative mechanisms in decision maker (Cammarata, 1994; Turban and Aronson, 2002). The structured nature of the model helps the manager avoid those cognitive distortions associated to badly structured decision process. In fact, the use of too informal approaches to decision can be risky because some relevant variables may be missed or not adequately contemplated in in-use heuristics.

The modularity of the FES allows an easy decomposition of the results and makes the decision path more visible (Magni et al. 2004). The decision maker can easily read the tree model and understand the reasons why (that is to say, thanks to the contribution of which variables) a country scores in a different way from another one. This gives useful additional information to decision maker. For example, to know the scores of some intermediate variables of the decision model can offer helpful insights for the formulation and the fine-tuning of the entry strategy in a country market. What is more, the final choice itself about which country to enter may be oriented not only from the overall score (MEScore) but also from the intermediate scores on market attractiveness and accessibility variables (Table 6) and from the input variables. The manager, thus, can appoint a market that scores higher than others in an intermediate variable but not in the overall ranking. This fact adds flexibility to the system and makes it particularly useful for a small firm, whose

decision context is strongly embedded in the entrepreneur's cognitive frame. The application of a fuzzy logic helps the model retain the nuances of the managerial judgement so increasing the informational value for decision (RQ2).

Within the series of the best performing countries, the entrepreneur took the decision to select Switzerland as the first country to enter in the firm's gradual internationalisation process. Switzerland is the second top-ranking countries as overall score (but very close to the first ranked country) and it is the best in terms of accessibility. Therefore, once the group of the more attractive countries (according to the firm's product positioning and strategy) has been skimmed off, the decision maker can choose the more accessible. This is coherent with the second pillar of the firm's international strategy: to invest a relatively small amount of resources in foreign markets and to start with a country less distant to the home market. Not surprisingly, the entrepreneur in the past had developed some strong trade relationships within a Swiss-based network. Also in this case, the model proved a good attitude to capture and codify the experiential knowledge and the strategic aims of the decision maker (RQ3).

5. Managerial implications

The findings suggest some interesting insights in terms of managerial implications.

The main point is that the methodology here proposed forces the decision maker to think in a more complex way about the decision to take: quantitative and qualitative variables are to be considered together, tacit knowledge in form of perceptions must be articulated and linguistically codified, the whole set of the variables which are

relevant for the problem solution is to be structured. The interactive configuration of the process encourages the acquisition of pieces of formally defined external knowledge that can be helpful to support the decision. Futhermore, a so formalised model is able to retain the managerial knowledge about any single decision process. The knowledge is stored up in the system memory and available to other organisational members in similar decision contexts (Turban and Aronson, 2002). Most important to say, the model here proposed is a system that may support, not replace, the decision process that are really in use in the firm. For this reason, the model must conserve a high level of flexibility in its implementation and use. The aim is to preserve the nuances and fuzziness of the managerial judgments and put them into the rigourous structure of a tree-shaped decision scheme. All these traits of the decision model seem to be particularly important for small firms, which are greatly exposed to the risk of cognitive distortions in their decision making activity.

Of course, a FES is all but a simple tool to be designed and implemented, especially in a small firm. The model development requires a tight collaboration between the firm's expert (the manager who has to take the decision) and the system designer (the expert who has to map the decision process, to represent it in a decision tree, to transform the latter in a FES, to run the programme). This collaboration takes the typical semblance of a cognitive interaction and shares some of the common problems of the knowledge transfer and generation processes. The system designer is not simply the engineer of the system; he/she acts as a knowledge broker (as helps the firm acquire knowledge from the external environment) and a knowledge co-creator (as supports the firm in integrating different knowledge and to put it in an

effective decision model). The management of these knowledge processes, especially for a small firm, requires specific competencies, high commitment, as well as the willingness to invest time and human resources. A task not so easy to perform, and not so common among small firms. This is the reason why many firms (not only the smallest ones) are generally endowed, if any, with less expensive (and often less useful) standardised decision support systems.

6. Conclusions

The foreign markets evaluation is a complex process intensively studied in the literature. Nevertheless, the methods proposed till now, either based on normative models or purely conceptual, do not represent a satisfying solution for some important managerial problems.

In this work, we propose and test a model for the international market selection more suitable for small firms and for relatively unstructed decision contexts. Findings give a first contribution to the discussion of the broad research questions we posit, as outlined in the previous sections.

This is, maybe, the more interesting finding: it is the methodology of the model in itself that seems to force the manager to "give more structure" to his/her unstructured and low formalised in-use decision processes. Following Papadopoulos and Denis's (1988, p. 48) suggestion to develop and test "conceptual models that outline the process (rather than content) of information-gathering and the methods by which inputs can be analysed to aid in decision-making", the analysis of a small firm's decision context makes quite evident that, while the specific content of the variables

to be included in the model may frequently change, the importance of the quality of the process remains. The process is the core of the model. The content follows.

Some limitations characterise the present work.

First, the internal validity of the model must be better tested. The robustness of an expert system, in fact, can be inferred by its ability, regardless of the input data sets, to return outcomes always consistent with the firm's strategic orientation and managerial judgement frame. In any situation, the model must fit the managerial and strategic cognitive frame. A sensitivity analysis is so needed.

Also a more robust external validity test is necessary. The manager's validation carried out here is an important proof of the model's ability to intercept and combine relevant knowledge in the small firms' decision contexts. However, validation tests should be extended to other firm's decision process (like the entry mode choice) and anchored to different set of variables affecting their outcomes.

Moreover, the main extant limit is connected to the need to extend the application tests of the model methodology to a larger group of small firms. The aim is to test further and refine the methodology used for the international markets selection decision process. Here again, the process is still the "core".

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