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Corporate social irresponsibility: review and conceptual boundaries

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Received 9 May 2016 Revised 28 September 2016 6 March 2017 Accepted 9 April 2017 Marta Riera and María Iborra Universitat de València, Valencia, Spain

Abstract

Purpose – The purpose of this paper is to carry out a review of the academic literature about corporate social irresponsibility (CSIR) highlighting aspects that help us to define socially irresponsible behaviour and its relationship with socially responsible behaviour.

Design/methodology/approach – Through a Boolean search of studies related to terms of irresponsibility undertaken from 1956 to October 2016, the authors develop a review of the literature focussing on the main perspectives used for defining the term of CSIR.

Findings – The paper provides a framework of three main dimensions for understanding the differences in the literature that defines CSIR: who defines irresponsible behaviour, an impartial observer or a specific group of stakeholders, whether it is a firm strategy or a punctual action and which is the relationship between corporate social responsibility (CSR) and CSIR, continuity vs orthogonal relationship.

Originality/value – The paper provides and extensive and original review of a key construct, CSIR, and develops some insights about its antecedents and consequences. The authors try to provide light to the contradictory situation where a growing interest in CSR and the increase in voluntary commitments adopted by company leaders incorporating CSR into their strategies are, paradoxically, increasingly associated with CSIR.

Keywords Corporate social responsibility, Unethical behaviour, Corruption, Fraud, Corporate social irresponsibility

Paper type Research paper

Introduction

In September 2015, accusations against the German company Volkswagen (VW) and its acceptance of the fraud carried out on more than 11 million vehicles shocked the business world[1]. This scandal generated, among other serious social and economic consequences, a situation of distrust towards the firm, an unprecedented loss of reputation and an immediate and important loss of value for its shareholders[2]. The perplexity is increased when it is observed that, in the same month, the company's website stated that VW, under the heading of "corporate social responsibility" (CSR), considered itself a "corporate citizen", responsible for its activities and obligations arising from them, giving their social and ecological objectives the same priority as economic ones. Moreover, this responsible behaviour was reported to interest groups as part of the unique nature of the company and its corporate culture. It specified, among other things, its active participation in the United Nations Global Compact in the Global Reporting Initiative, taking up leading positions in the international ratings and CSR[3] indices and, even, in some cases being the leader in their sector ratings.



JEL Classification — M14

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European Journal of Management and Business Economics Vol. 26 No. 2, 2017 pp. 146-162 Emerald Publishing Limited 2444-8451 DOI 10.1108/EJMBE-07-2017-009 Unfortunately, this widely reported case of contradiction between CSR and corporate social irresponsibility (CSIR) is not unique. The importance of CSIR derives not only from its direct consequences and risks for the companies involved and their interest groups, but also has implications for other institutions, as these situations can cause an increase in the sense of scepticism and a lack of confidence in, and credibility of, CSR.

This contradiction has also received attention from the academic perspective. Thus, Kotchen and Moon (2012) argue that this contradiction reaches its apex in the use of CSR[4] policies as a strategy to divert attention away from unethical behaviour; i.e. by counterbalancing and compensating for socially irresponsible behaviour by using CSR as "image washing" in order to increase credibility and reputation with interest groups.

Although empirical evidence shows the existence of companies that behave in a socially irresponsible manner, with its important consequences, the academic literature has focussed little on the concept of CSIR. Academic interest began with the first study by Armstrong (1977), who posited that CSIR was the immoral decision made by the directors of a company with the aim of creating shareholder value at the expense of others, where groups of impartial observers played a fundamental role because they were responsible for assessing the irresponsibility of such behaviour. Thirty years would have to pass before there was decisive return to academic interest in this concept. During the last global economic and financial crisis, and thanks to the broadcasting role of the media, a significant number of business scandals have been reported, which showed an unprecedented increase in their incidence. This new scenario has also aroused interest in CSIR from a professional point of view; on the one hand, for the important consequences that all irresponsible behaviours can generate at the corporate level and, on the other, because it has become clear that behind the irresponsible behaviour can be perceived an absence of values and ethical principles among the top executives of companies. Business professionals focus on issues such as the implementation of controls to anticipate, monitor and avoid this type of behaviour. For these professionals, it is crucial to have a greater knowledge and better understanding of the mechanisms and tools that can help them to alleviate the possible damage caused by this corporate behaviour. All this, therefore, has generated greater interest and concern in the academic community - and in society - in this phenomenon.

Although attempts to conceptualize CSIR are scarce and have not allowed a consensus to be reached in its definition, they have generated debate among academics and have led to efforts to further its study in order to provide a more precise definition. The objective of this study is to offer a better understanding of the concept of CSIR through literature review focussing, further, on its relationship with CSR, since the contradiction between socially responsible commitment and irresponsible behaviour is a reality that deserves to be analysed and that opens up new research questions.

In order to address this objective, we carried out an analysis of the academic literature on CSIR from its inception to the present, allowing those interested in this topic to understand the current status of the literature on the concept, and we try to narrow the existing gap in the literature, providing a more precise definition of CSIR and proposing new lines of research not undertaken to date. Thus, the objective of this paper is to contribute to the academic literature in the following ways: first, by carrying out a systematic review of the literature that allows us to analyse what CSIR is. This review will lead us to highlight the main perspectives of those who have studied it, emphasizing the aspects that help us to define socially irresponsible behaviour and its relation to socially responsible behaviour and second, establishing the implications of the definition of CSIR at the corporate level leads towards future lines of investigation such as on the antecedents, consequences or mechanisms of control of socially irresponsible behaviour.

With this aim, the work is structured presenting, first, the methodology used to approach the bibliographic review. The second section has the objective of defining the concept of

CSIR: review and conceptual boundaries CSIR and the diverse perspectives that we find on the subject in the literature. The work closes with conclusions proposing new lines of research that should be developed in order to improve our understanding of this phenomenon.

Methodology

The sample of articles analysed was obtained from the Web of Science electronic database. in particular, from the Social Science Citation Index collection. To undertake this, the following search steps were carried out[5]: first, we defined the search criteria and the time period during which the works were undertaken. In this regard, we developed a Boolean search (Casimir and Tobi, 2011; Meglio and Risberg, 2011) of studies related to CSIR undertaken from 1956 to October 2016. To obtain the sample we selected the following words or groups of words written in English (the academic literature is almost entirely in this language) that should appear in the study themes. The search for articles was carried out where, in the article subject matter, any of the following terms appear: "Social Irresponsibility" or "Social Irresponsible Behaviour" or "Greenwashing" or "Fraud" or "Bribery" or "Corruption" or "Corporate Accounting Scandal" or "Environmental Damage" or "Employees Abuses", and always including the term "Business". Once the academic outcome of this preliminary search was obtained, the second stage of the research consisted in limiting the search only to the category "articles" in those journals belonging to the "Business" category, since the scope of this work is related to the business world and business management, as we want to offer a review of the concept of CSIR in the field of strategic management. Based on the Thomson ISI Journal Citation Report, the sample is limited to those journals that include at least three articles on some of the topics included as terms in the search criteria. The selected journals and the number of articles published by each of them are shown in Table I.

On the completion of these first two phases, we had obtained a total of 706 articles. As can be seen from Table I, the ten journals that published most about CSIR are those related to the study of ethics and sustainability in business. Noteworthy is the *Journal of Business Ethics*, with 44 per cent of articles in the sample.

The theme of the selected studies is heterogeneous. Table II presents the topics studied in the academic literature and their contribution in percentage terms with respect to the total sample.

Of the articles in the sample, 61 per cent are directly related to some aspect of CSIR[6]. The categories of CSIR that have received the most attention are those of "Antecedents of CSIR" and "Mechanisms for Control and Prevention of CSIR", with 24 and 18 per cent, respectively. Nevertheless, the articles that analyse the central theme of our work, the definition of CSIR, contribute a percentage of 3 per cent of the total.

In order to study the concept and definition of CSIR, the paper focusses on the 21 articles in the sample that address, as the central theme, the concept of CSIR, the object of our work. In addition, through the reading of the papers and reviewing their bibliographical references, we added four articles to the initial sample that also study the CSIR concept. Two of them were published in journals[7] that do not have the Journal Citation Report. The other two were not initially considered because one of these articles was published in the *Journal of Marketing*, a journal that only provided two articles with topics included in the search criteria, while the other article was published in The *B.E. Journal of Economic Analysis & Policy*, a journal belonging to the Economics category, not the Business category.

An approach to the concept of CSIR

Armstrong's (1977) work pioneered an approach to the CSIR concept, stating that "irresponsible behaviour is a decision to accept an alternative that is thought by the decision maker to be inferior to another alternative when the effects upon all parties are considered.

EIMBE

26.2

| | | CCID |
|--|------------------------------|-----------------------|
| Name of the journal | Number of published articles | and conceptual |
| Journal of Business Ethics | 311 | houndaries |
| Journal of Environmental Economics and Management | 52 | Doulidatics |
| Journal of Business Research | 25 | |
| Harvard Rusiness Review | 24 | |
| Journal of International Business Studies | 24 | |
| International Rusiness Review | 19 | 149 |
| African Journal of Rusiness Management | 17 | |
| Business Filics Quarterly | 17 | |
| Journal of World Business | 17 | |
| Corborate Covernance: An International Review | 13 | |
| Business Horizons | 19 | |
| Emorging Markets Finance and Trade | 12 | |
| Amorican Rusinoss I an Iournal | 10 | |
| Tachmological Forecasting and Social Change | 10 | |
| Transformations in Rusings & Economics | 9 | |
| Provinces Ethics: A European Devicen | 9 | |
| Management Devision | 0 | |
| Dublic Deletione Deview | 0 | |
| Fuduc Retained Section Review | 0 7 | |
| Corporate Social Responsibility and Environmental Management | 1 | |
| Journal 0) Business Economics and Management Stratagia Management Journal | 1 | |
| Strategic Management Journal | (| |
| Academy of Management Review | 6 | |
| Journal of World Energy Law & Business | 6 | |
| Small Business Economics | 6 | |
| Academy of Management Journal | 5 | |
| Business Strategy and the Environment | 5 | |
| California Management Review | 5 | |
| Journal of Public Policy & Marketing | 5 | |
| Business History Review | 4 | |
| International Small Business Journal | 4 | |
| Journal of Macromarketing | 4 | |
| Journal of Management Studies | 4 | |
| Long Range Planning | 4 | |
| South African Journal of Business Management | 3 | |
| Academy of Management Perspectives | 3 | |
| British Journal of Management | 3 | |
| Business & Society | 3 | |
| Enterprise & Society | 3 | |
| Entrepreneurship Theory and Practice | 3 | |
| Industrial Marketing Management | 3 | |
| International Journal of Consumer Studies | 3 | |
| Journal of Business and Psychology | 3 | Table I |
| Journal of Business Venturing | 3 | Relationship between |
| Journal of Management | 3 | journals and number |
| Number of total articles | 706 | of published articles |
| Source: Authors' elaboration from the Web of Science database and literature | e review | about CSIR |

Generally, it implies a gain for one party at the expense of the total system" and that "an act was irresponsible if a vast majority of unbiased observers would agree that this was so" (p. 185).

Although the concept is around 40 years old, interest in the subject has not received an impulse until recent times[8]. The revision of the literature allows us to observe conceptual discrepancies around three major issues that are discussed below.

In this regard, the first dimension in which the works that study the concept of CSIR differs focusses on analysing who judges the irresponsibility of behaviour. Thus, a set of

| EJMBE 262 | Topics | Number of articles | % |
|--|--|--------------------|-------|
| 20,2 | Antecedents of CSIR | 169 | 23 94 |
| | Others | 143 | 20.25 |
| | Control mechanisms of CSIR | 127 | 17.99 |
| | Consequences of CSIR | 102 | 14.45 |
| | Antecedents of CSR | 33 | 4.67 |
| 150 | Consequences of CSR | 28 | 3.97 |
| | Corruption in general | 26 | 3.68 |
| | Ethics | 26 | 3.68 |
| | Concept of CSIR | 21 | 2.97 |
| | Bribery | 10 | 1.42 |
| | Responsible leadership | 6 | 0.85 |
| | Antecedents and control mechanisms of CSIR ^a | 5 | 0.71 |
| | Definition of CSR | 5 | 0.71 |
| | Mechanisms and consequences of CSIR ^a | 3 | 0.42 |
| | Antecedents and consequences of CSIR ^a | 1 | 0.14 |
| Table II | Antecedents, consequences and control mechanisms of CSIR ^a | 1 | 0.14 |
| Relationship of | Total | 706 | 100 |
| items included in selected journals | Note: ^a In the same article, these topics are covered jointly Source: Authors' elaboration from the Web of Science database | | |

academic articles develops the concept of CSIR focussing on the idea that the definition of irresponsibility should be made by "impartial observers", that is, those who have no direct interest in the organization. On the contrary, other studies, through a focus on interest groups, determine who decides what is and is not irresponsible.

Armstrong (1977), a pioneer in the study of CSIR, is the first author who posits that impartial observers, through their subjective perceptions, are those who would determine if behaviour is irresponsible. Subsequent studies by Armstrong and Green (2013) and Herzig and Moon (2013) also agree with this initial definition, positing that CSIR is the failure of CSR towards the expectations of society in general, without specifying which group of interests it damages, whereas society, in an impartial way, is in charge of evaluating if a company is socially irresponsible.

Other studies move away from the perspective of impartial observers, advocating the shareholders vs interest groups approach to define socially irresponsible behaviour. Sustained in stakeholder theory (Freeman, 1984), these are based on the idea of harmful operations or behaviour, of those responsible for the management of a business organization, towards its environment. They specify that the harmful behaviour is connected to a specific interest group with a specific interest in the organization. Therefore, CSIR would be defined by the set of subjective perceptions of those observers who have a specific interest in that organization. This perspective begins with the work of Brammer and Pavelin (2005) who, faced with corporate behaviour that causes damage, consider that the stakeholders of the company, based on their perceptions and reactions, are those who assess the loss of value or reputation of that company.

Three years later, the empirical studies of Wagner *et al.* (2008) and Williams and Zinkin (2008) analysed CSIR from the perspective of a specific interest group, namely consumers. Wagner *et al.* (2008), conscious of the need to determine what are the behaviours of companies that are perceived as irresponsible, and how these could be measured, constructed a scale with 14 dimensions that measured the perceptions of consumers of the CSIR of retail companies. These authors stress the need to study how demographic differences influence the perceptions that consumers have about CSIR. In this vein, Williams and Zinkin (2008) show, from the cultural dimensions of Hofstede, that the

propensity of consumers to punish companies for carrying out socially irresponsible behaviour varies between countries.

Subsequently, Lange and Washburn (2012) also define CSIR from a perspective of partial observers, although with nuances. In this regard, Lange and Washburn (2012) propose a definition of socially irresponsible behaviour from a psychological and subjective perspective, based on the perceptions of observers. For these authors, social irresponsibility could be defined as the carrying out of acts that violate certain perceived standards of social responsibility and which are judged by external observers, interest groups and voters, that is, behaviour is perceived to be responsible or irresponsible in the "real world" and part of the environment surrounding the company. For example, how do employees perceive certain policies as in the case of actions related to health and safety violations? Or how do suppliers or employees perceive problems in the supply chain? Or what consequences are associated with the issue of diversity in the workplace? Or, also, how is this behaviour perceived by customers of your direct competitor? How is this behaviour perceived by the employees of other companies in the sector in which you operate? How is this behaviour perceived by the citizens of a neighbouring country? In short, they suggest that the irresponsibility of behaviour would be judged by the subjective perceptions of individuals that serve as indicators of what they consider to be socially irresponsible behaviour and its impact.

In relation to the idea that CSIR is the outcome of a set of subjective and psychological perceptions of observers, a group of authors advocates the existence of certain factors as moderators of such perceptions. On the one hand, Perks *et al.* (2013) consider that the promotion of CSR information campaigns by companies would change the individual's perceptions, diverting attention from socially irresponsible behaviours. On the other hand, Antonetti and Maklan in 2016 carried out two empirical studies that demonstrate how the feelings of the individual influence opinion as to whether certain business behaviour is or is not socially irresponsible. The first study analyses the anger of stakeholders as a result of the moral indignation caused by some corporate behaviours (Antonetti and Maklan, 2016a), while the second study considers how sympathy and positive identification of the company with its interest groups can modify or slant negative perceptions (Antonetti and Maklan, 2016b).

Finally, although most papers argue that CSIR is a result of subjective perceptions of interest groups, the work of Pearce and Manz (2011) proposes a definition of CSIR based on the damage caused to stakeholders. In this regard, Pearce and Manz (2011) define CSIR as the "unethical executive behavior that shows disregard for the welfare of others, that at its extreme is manifested when executives seek personal gain at the expense of employees, shareholders, and other organization stakeholders, and even society at large" (p. 563). Therefore, Pearce and Manz (2011) adopt an agency approach in which executives seek to maximize their personal gains at the expense of loss or disadvantage to the interests of their own stakeholders, including employees, shareholders, etc. Table III presents the evolution of the CSIR concept from the dimension of unbiased observers vs partial observers.

A second dimension that allows the classification of the diversity of contributions of the articles defining CSIR is based on whether they conceptualize CSIR from the perspective of the intentionality or non-intentionality of the behaviour; that is to say, to what extent CSIR is an occasional irresponsible action and a failure of CSR or, on the contrary, reflects an intentional strategy. Regarding this dimension, there are studies that consider CSIR as an occasional failure of CSR (Perks *et al.*, 2013), that is, companies do not intend to cause damage through their actions. In this regard, CSIR is perceived as the result of unfortunate events, not consciously carried out by the managers of a company, which is why socially irresponsible behaviour is considered an occasional failure of CSR. Examples of non-intentionality of CSIR would be an event caused by external forces, such as the damage caused to the environment as a result of an unexpected earthquake or when potential lethal effects of a drug emerge only after the product has been introduced into the market (Lin-Hi and Müller, 2013).

CSIR: review and conceptual boundaries

| FIMDE | | | | | | |
|---|---|--------------------------------------|----------|--|----------------------|---------------------|
| 26,2 | Title | Authors | Year | Name of the journal | Partial observers | Impartial observers |
| | "Socially irresponsibility in management" | Armstrong | 1977 | Journal of Business Research | | Х |
| 152 | "Corporate reputation and an insurance motivation for corporate social | Brammer and | 2005 | Journal of Corporate Citizenship | Х | |
| 152 | "The effect of culture on consumer willingness to punish irresponsible corporate behaviour: applying Hofstede typology to the punishment aspect of corporate social irresponsibility" | Vavelin Williams and Zinkin | 2008 | Business Ethics: A European Review | Х | |
| | "The dark side of retailing: toward a scale of corporate social irresponsibility" | Wagner et al. | 2008 | International Journal of Retail & Distribution Management | Х | |
| | "Leadership centrality and corporate social irresponsibility (CSIR): the potential ameliorating effects of self and shared leadership on CSIR" | Pearce and Manz | 2011 | Journal of Business Ethics | Х | |
| | "Understanding attribution of corporate social irresponsibility" | Lange and Washburn | 2012 | Academy of Management Review | Х | |
| | "Effects of corporate social responsibility and irresponsibility policies" | Armstrong and Green | 2013 | Journal of Business Research | | Х |
| | "Communicating responsibility- practicing irresponsibility in CSR | Perks <i>et al</i> . | 2013 | Journal of Business Research | Х | |
| | "Discourses on corporate social ir/ responsibility in the financial sector" | Herzig and Moon | 2013 | Journal of Business Research | | Х |
| | "An extended moral of moral outrage at corporate social irresponsibility" | Antonetti and | 2016a | Journal of Business Ethics | Х | |
| Table III. Chronological evolution of partial observers approach vs | "Social identification and corporate irresponsibility: a model of stakeholder punitive intentions" | Maklan Antonetti and Maklan | 2016b | British Journal of Management | Х | |
| impartial observers | Source: Authors' elaboration from the W | Veb of Science | e databa | ase and literature review | V | |

However, even though the CSIR would be the result of involuntary behaviour on the part of the company, it would not be exempt from total responsibility for the event. Lin-Hi and Müller (2013) posit that CSIR should be considered an intentional strategy of the company rather than an occasional event of socially responsible behaviour failure, as the intention of the corporate behaviour, the ultimate goal of a company, is the maximization of profit. For example, bribery facilitates the winning of lucrative contracts and illegal waste disposal can be an effective way to reduce costs. In summary, CSIR can be defined as "corporate actions that result in (potential) disadvantages and/or harm to other actors" (p. 1929)[9].

Pearce and Manz (2011) also define CSIR from the behavioural intentionality perspective because executives deliberately seek to maximize their personal gain without regard to the losses or damages caused to their stakeholders. Lange and Washburn (2012) and Keig *et al.* (2015) also posit that CSIR is more than the failure of a company to behave responsibly: CSIR is the result of an intentional business strategy, decision or action that affects the aspirations of the stakeholders in an individualized way. In this same vein, Strike *et al.* (2006), based on resources and capabilities theory, explain that when there is diversification, corporate reputation and learning are intangible resources directly related to

social responsibility. Large corporations are more visible and subject to greater media scrutiny, especially if they are diversified internationally, so these companies are more aware of protecting their reputations and, therefore, in engaging in socially responsible behaviour (Fombrun, 1996). In turn, these business organizations can carry out socially irresponsible behaviour more easily the more internationally diversified they are. The parent company has incentives to locate its subsidiaries in countries where there is less commitment to social issues because the costs will be lower, illustrating CSIR intention as part of a company's profit-seeking strategy.

Table IV presents the evolution of the concept of CSIR from the dimension of behaviour's intentionality and considers whether it is an occasional action as opposed to an intentional strategy.

The definition of Strike *et al.* (2006) opens the door to analyse the third dimension in which the revised papers differ, which is derived from the relationship between CSIR and CSR, and how the literature proposes a connection between the two. While some works conceptualize CSR and CSIR as a continuum, i.e. CSIR and CSR are incompatible phenomena and a company cannot behave in a socially responsible and irresponsible manner at the same time, others define them as two orthogonal concepts, that is, they are two different concepts with distinct causes and consequences that deserve, therefore, individualized attention.

From the perspective of continuity, Jones et al. (2009) contend that CSR and CSIR are extremes of the same continuum. Table V presents the contrast between the two constructs when they are conceptualized as two ends of a continuum.

In this regard, at one end of the continuum would be CSIR, understood as the strict orientation to the maximization and achievement of shareholder profit at the expense of other stakeholders, while CSR, located at the opposite end of the continuum, meets all the interests and expectations of the interest groups when it comes to decision making. In short, these authors suggest that CSIR is a term better suited to the shareholder business model (Friedman, 1962), while CSR is more applicable to works that study the business model of interest groups (Freeman, 1984).

| Title | Authors | Year | Name of the journal | Strategic behaviour | Occasional action | |
|---|-----------------------|------|--|------------------------|-------------------|--|
| "Being good while being bad: social responsibility and the diversification of US firms" | Strike et al. | 2006 | Journal of International Puojinggo Studiog | Х | | |
| "Leadership centrality and corporate social irresponsibility (CSIR): the potential ameliorating effects of self and shared leadership on CSIR" | Pearce and Manz | 2011 | Journal of Business Ethics | Х | | |
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| "Communicating responsibility-practicing irresponsibility in CSR advertisements" | Perks <i>et al</i> . | 2013 | Journal of Business Research | | Х | |
| "Formal and informal corruption environments and multinational enterprise social irresponsibility" | Keig et al. | 2015 | Journal of Management Studies | Х | | Table IV. Chronological evolution of strategic behaviour approach |
| Source: Authors' elaboration from the Web of | iew | | vs occasional action | | | |

CSIR: review and conceptual boundaries

| EJMBE 26.2 | Corporate social irresponsibility | Corporate social responsibility |
|--|--|---|
| , _ | Environmental degradation and pollution are inevitable and little precaution is taken | Environmental degradation and pollution is not inevitable and should not be tolerated, and it is important to raise awareness and commit to action |
| | Employees are a resource to be exploited | Employees are a resource to be valued |
| 154 | Only basic, and sometimes reluctant, compliance with legislation pertaining to CSR Ethical issues are on the periphery | Compliance with, as well as policy and practical actions that go beyond the minimum legislative requirements for CSR Ethical issues are central to the organization |
| | New technologies should be developed and introduced to the market Treating suppliers and customers unfairly Sustainability defined in terms of business survival | New technologies should be developed, tested, evaluated and only introduced to the market if they do not cause harm Working fairly with suppliers and customers Sustainability defined in terms of business, environmental and community survival and mutual growth Profit is one of many purposes of business and should be |
| Table V. CSIR and CSR as two ends of the same continuum | should be achieved at any cost Sources: Table included in page 1808 in Murp <i>al.</i> (2009) work | achieved, but not at any cost hy and Schlegelmilch (2013) work and adapted from Jones <i>et</i> |

Moreover, Windsor (2013) defines CSIR as an interdependent concept of CSR. While CSIR is the loss of social wellbeing resulting from the illegitimate gain obtained by shareholders at the expense of interest groups, CSR is mandatory compliance with laws and ethics to avoid CSIR and an increase in wellbeing through voluntary increases in the social wellbeing of some stakeholders. Both concepts, therefore, constitute two extremes of the same continuum, CSIR being the lowest limit of CSR. CSIR is the damage caused to social wellbeing by failure to comply with established CSR. Therefore, for Windsor (2013) CSIR-CSR are considered as two ends of a continuum that managers can promote CSIR and reduce control over CSR and vice versa.

On the other hand, we find those who view CSR and CSIR from the perspective of orthogonality, since they consider that they are two differentiated concepts. While the previous positions argue that the relationship between CSIR and CSR is a zero-sum game – more irresponsibility entails less responsibility – the works developed from the orthogonality perspective propose that both CSR and CSIR can increase or decrease in the same period and even, in some cases, a positive causal relationship is proposed: the higher the CSIR, the higher the CSR. After reviewing the articles that study this relationship, orthogonality can be explained from four different perspectives: depending on the unit of analysis we can identify responsible and irresponsible departments within the same company; depending on the dimensions analysed that allow the perception that a company is responsible in one dimension, but not in others; depending on the CSR. and the CSR.

First, considering the unit of analysis perspective, Strike *et al.* (2006) observe the existence of orthogonality in multinational enterprise groups: internationally diversified firms, as we have already indicated, can behave in a socially responsible manner in one geographic location and, simultaneously, be irresponsible in another location. That is, one organizational unit of a company can be socially responsible and another can have irresponsible behaviours. Their findings for multinational enterprises with geographically dispersed units could be extended to units in diversified businesses, among others.

Second, according to the analysed dimensions, Herzig and Moon (2013) posit that companies can be "good" at the same time as they are "bad", illustrating this contradiction with the Siemens case which, although it operates with high social and environmental standards, is also considered to be guilty under the US Corrupt Foreign Practices Act. This idea is supported by Keig *et al.* (2015), since they consider that a company can have a strong commitment in one area of social responsibility and be irresponsible in another,

exemplifying this situation with the case of Starbucks that, although it presents high levels of CSR in behaviours with the environment and in its community relations, shows at the same time high levels of CSIR in aspects such as supplier relations. In this regard, and starting from the three basic dimensions of CSR (economic, environmental and social), companies could manifest CSR in one or more dimensions while in others they can be irresponsible.

Third, from the perspective of interest group perceptions, Rodriguez *et al.* (2006), Lange and Washburn (2012) and Keig *et al.* (2015) also propose the orthogonality of CSR-CSIR. These authors argue that CSIR is a concept differentiated from CSR, since it has its own measure for the evaluation of the level of CSIR, taking into account the position from which the behaviour is evaluated; that is, behaviour can be considered socially responsible from the perspective of certain stakeholders and be perceived as irresponsible by others. In this same vein, Cruz *et al.* (2014) analyse the orthogonality of CSIR and CSR from the perspective of family enterprises, since they posit that a family business can behave in a socially responsible and irresponsible way at the same time; family businesses can be socially responsible with their external interest groups (who bestow reputation and legitimacy to a company, so that the company is more concerned with meeting their interests) and socially irresponsible in their relationships with internal interests (considered as a threat because they jeopardize the control of the family business), suggesting that these types of companies are simultaneously responsible and irresponsible.

In these first three contributions on the orthogonality relationship between CSR and CSIR, neither a causal relationship between both is expected, nor a zero-sum game. More CSR does not imply more CSIR or vice versa.

The last group of papers, however, proposes a positive relationship between CSR and CSIR. These papers propose that CSR emerges as a strategy to offset for socially irresponsible behaviours. In this regard, the work on the Chrysler case carried out by McMahon (1999) was the first to establish this relationship: it contends that CSIR is the antonym of CSR (CSIR shows no sense of responsibility, is not reliable and is little supported) exemplified in the Chrysler case where the company went from being irresponsible with employees and the community due to the closure of the plant in Kenosha, Wisconsin, to being responsible due to social pressure, through financial compensation for its employees and the local community. Muller and Kräussl (2011) contend, in this regard, that a positive relationship exists between the irresponsible reputation of a company and its fall in market value during a disaster and its subsequent commitment on socially responsible issues after the disaster. In this regard, Kotchen and Moon (2012) also propose a relation of positive causal dependence between both concepts. They introduce the thesis that companies carry out corporate socially responsible actions to offset for corporate irresponsibility. Thus, when companies do more harm, they also do more good things, as a strategy to offset for bad behaviour. Therefore, CSR and CSIR would be concepts with a causal relationship. Kotchen and Moon (2012) highlight that companies implement CSR policies not because they believe in CSR, but because it brings more benefits than costs to the organization; while CSR generates profits and sales, CSIR generates costs and externalities, simultaneously. Similarly, Kang et al. (2016) also contend that companies commit to CSR to offset for their CSIR.

From the perspective of orthogonality, therefore, it is considered that a company can adopt these behaviours at the same time, so that the concepts of CSR and CSIR are treated as two differentiated constructs and should not be considered as opposite ends of the same continuum, emphasizing the thesis that it is not sufficient or correct to describe CSIR as the lowest level of CSR. Table VI presents the evolution of the CSIR concept from the continuity vs orthogonality approach.

From the review of the academic literature, we propose that progress in the understanding of CSIR requires a definition: from an orthogonal approach, in line with Strike *et al.* (2006), there is ample empirical evidence that CSIR and CSR do not behave as a zero-sum game and

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| EJMBE | Title | Authors | Year | Name of the journal | Orthogonality | Continuity |
|---|---|-------------------------|--------|--|---------------|------------|
| 20,2 | "From social irresponsibility to social responsiveness: the Chrysler/Kenosha | McMahon | 1999 | Journal of Business Ethics | Х | |
| 156 | "Three lenses on the multinational enterprise: politics, corruption and CSR" | Rodriguez <i>et al.</i> | 2006 | Journal of International Business Studies | Х | |
| | "Being good while being bad: social responsibility and the diversification of US firms" | Strike <i>et al</i> . | 2006 | Journal of International Business Studies | Х | |
| | "Corporate irresponsibility and corporate social responsibility: competing realities" | Jones et al. | 2009 | Social Responsibility Journal | | Х |
| | "Doing good deeds in times of need: a strategic perspective on corporate disaster donation" | Muller and Kräussl | 2011 | Strategic Management Journal | Х | |
| | "Understanding attribution of corporate social irresponsibility" | Lange and Washburn | 2012 | Academy of Management Review | Х | |
| | "Corporate social responsibility for irresponsibility" | Kotchen and Moon | 2012 | The B.E. Journal of Economic Analysis & Policy | Х | |
| | "Corporate social responsibility and irresponsibility: a positive theory approach" | Windsor | 2013 | Journal of Business Research | | Х |
| | "Discourses on corporate social ir/ responsibility in the financial sector" | Herzig and Moon | 2013 | Journal of Business Research | Х | |
| | "Are family firms more socially responsible?" | Cruz et al. | 2014 | Entrepreneurship Theory and Practice | Х | |
| Table VI. | "Formal and informal corruption environments and multinational enterprise social irresponsibility" | Keig et al. | 2015 | Journal of Management Studies | Х | |
| chronological evolution of orthogonality approach vs | "Washing away your sins? Corporate social responsibility, corporate social irresponsibility and firm performance" | Kang <i>et al</i> . | 2016 | Journal of Marketing | Х | |
| continuity | Source: Authors' elaboration from the | Web of Scie | nce da | tabase and literature | review | |

that at the same time there can be high levels of both in the same company and, therefore, they are differentiated concepts. The progress of the research will require that future studies look deeper into the relationship between both constructs, CSR and CSIR, in the strength and the valence of their relationship; and from a strategic management focus, we posit that the behaviour carried out by an organization, whether responsible or irresponsible, derives from an intentional business strategy of its leaders or from the absence of measures on the future consequences of their actions; and that, while theoretically the concept of impartial observers is coherent and interesting, practical progress and the possibility of access to empirical evidence require observers to focus on an interest group approach. Thus, CSIR prejudices or adversely affects the fulfilment of the economic, environmental and social expectations of its main stakeholders and, ultimately, society.

Conclusions and future lines of research

The concept of CSIR is relatively new. Although the term was coined almost 40 years ago, it has not been studied or received attention in the literature until the last ten years; the unprecedented social and business alarms caused by CSIR cases, during the economic crisis, has led academics again to focus attention on its study (Lin-Hi and Müller, 2013).

As with the concept of CSR, there is no consensus on the definition of CSIR. In this study, we wanted to highlight the broad lines and themes of debate, making a proposal that provides progress in the study of CSIR. In this regard, a first consequence of its novelty is that few studies have focussed on analysing what it is and why this concept emerges. Even so, and after reviewing the evolution of the CSIR concept analysed by the literature, we have proposed an analysis of the various definitions of CSIR in three dimensions analysed by academics.

Although the initial works on the concept of CSIR from a more philosophical perspective advocated that the assessment of behaviour should be made by impartial observers, the need to reconcile this view with a more applied orientation has generated a tendency to consider that irresponsibility is assessed based on the perception of harm to the stakeholders of an organization.

As to whether CSIR is only a lower level of CSR or is a construct with its own identity, our work, after presenting the diversity of positions discussed in the literature, posits that the evidence suggests companies with CSR can perform acts of CSIR, such that sometimes socially responsible behaviours are performed with the purpose of compensating for, or diverting attention from, irresponsible behaviours.

In addition, the perspectives used to classify orthogonality, also, offer us the idea of the relationship that exists between the three analysed dimensions, since the orthogonality analysis has allowed us to introduce the assessment of irresponsibility and the intentionality of the behaviour to aid in the understanding CSIR as a whole. This has allowed us to develop our own definition of CSIR. Considering this analysis, we posit that CSIR is the result of an intentional strategy – and is more than an isolated event of failure of the company's socially responsible behaviour – that damages the interests of its stakeholders, provoking individual and subjective perceptions of observers with partisan interest in the company. Moreover, the definition of CSIR and CSR as two differentiated constructs opens up research questions for managers and researchers.

In the first place, Lin-Hi and Müller (2013) open a new question for future investigation regarding the definition of the concept – does CSIR imply a violation of the law or is a violation of the law considered as an unnecessary condition to define the CSIR? Because there are incomplete contracts and a lack of legal regulations on a global scale (Scherer and Palazzo, 2011), companies' actions may adversely affect others even if companies do not break the law.

In addition to improving the definition of the concept, future lines of research will need to answer the following questions: what are the antecedents of CSIR? what are its main consequences in the short and long term? and what management systems or tools favour or curb CSIR? that is, to take forward the study of the antecedents, moderators and consequences of CSIR.

As far as the first line of research is concerned, the literature on the antecedents of socially irresponsible behaviour or unethical behaviour is more extensive than that which focusses exclusively on the analysis of the concept of CSIR. As we have pointed out in the methodology section, there have been 169 articles derived from the research that discuss the antecedents of socially irresponsible behaviour. Reviewing these articles, the literature has suggested and, in some cases, has studied antecedents at the individual level, at the firm level and the environmental level. However, there is no clear model for understanding the causes that lead companies to behave in a socially irresponsible way, so it is necessary that in subsequent studies analyses be carried out to provide a better understanding of this issue (Zhao *et al.*, 2014).

In particular, academics have carried out their work on the antecedents of CSIR, mainly from institutional theory, to explain how government corruption influences the occurrence of CSIR (Ashforth and Anand, 2003; Cuervo-Cazurra, 2006; Chen *et al.*, 2008; Ioannou and Serafeim, 2012; Keig *et al.*, 2015). However, the literature suggests that other factors at the institutional level

CSIR: review and conceptual boundaries should be considered, such as the financial situation of the market, the level of competitiveness of the environment or competition between companies (Barrena *et al.*, 2016).

In addition, if CSR studies have ignored the role of business leaders in the formulation and implementation of socially responsible initiatives (Waldman and Siegel, 2008, p. 117), it should come as no surprise that very few studies have focussed on the analysis of the antecedents, at the individual level, of CSIR. In the field of psychology and moral behaviour, factors have been studied, such as morality and type of leadership, that exert a positive influence on the occurrence of CSIR (Pearce and Manz, 2011; Pearce *et al.*, 2014). A recent study by Grijalva and Harms (2014) further suggests that narcissism could be an antecedent of CSIR. Although these works propose some management characteristics as antecedents of CSIR, the scarcity surprises. In our opinion, we point out the urgent need to study, based on upper echelons theory (Hambrick and Mason, 1984), the influence of company management behaviours in CSIR, since they are the corporate elites who are ultimately responsible for the behaviours and actions of the organization they lead (Armstrong and Green, 2013; Pearce *et al.*, 2014).

Second, with regard to the consequences of socially irresponsible behaviour as a future line of research, CSIR involves risk and damage at both the institutional and company levels. Among the damages produced by CSIR we can distinguish economic loss and decrease in financial profitability, the loss of trust and a sense of scepticism on the part of interest groups that leads to loss of reputation, notoriety and effect on brand image and deterioration of the legitimacy of the company (Nieto, 2008). In fact, some studies argue that CSIR has a greater effect on interest groups than CSR (Lin-Hi and Müller, 2013). Moreover, we have been able to observe across the analysis of the works on CSIR that a great majority of academics argue that it is the perceptions of the interest groups of the companies that assess the irresponsibility of behaviour. Antonetti and Maklan (2016a) emphasize that morality in the reactions of stakeholders plays a very important role when dealing with cases of CSIR. This work provides a better understanding of how interest groups react to CSIR cases, through the moral damage that explains how observers assess corporate irresponsible behaviour and how this assessment leads to emotional reactions. Therefore, anger at socially irresponsible behaviour is an important driver of consumer and other interest group decisions to retaliate against businesses. Thus, a future line of research should continue to study the feelings and emotions of interest groups towards CSIR, as they directly influence the consequences of this type of behaviour.

On the other hand, the interest group most studied to assess the CSIR of a company are consumers. According to Aldás-Manzano *et al.* (2013, p. 22), "consumers respond more negatively when the company is socially irresponsible than positively to renown". However, half of consumers attribute these behaviours to selfish ends, a sign that scepticism is a very present variable in the evaluation of CSIR. In fact, even, if they are aware of the organization's deception and selfishness, it could create a very detrimental effect for the company: they have the power to buy no more products or services. Today, thanks to digitization and information technologies, consumers can damage the company's reputation and image with their assessments and ratings. Therefore, a new line of research is opened that tries to evaluate the impact of CSIR on intangible assets, in addition to the financial performance of a company. This diversity of consequences on emotions, reputation and/or performance points to the need to analyse the effects of CSIR in the short term as well as in the long term, since the consequences of CSIR will be different depending on the time horizon (Kouchaki and Gino, 2016).

Finally, with regard to the third line of research – CSIR control and prevention mechanisms – some of the studies centred on CSIR propose solutions to reduce the risk of companies carrying out socially irresponsible behaviours. Thus, Windsor (2013) establishes the importance of adopting control mechanisms to mitigate the level

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of CSIR, even to not permitting it to be present in companies. In this regard, the literature suggests that actions designed to prevent CSIR need to be taken (Minor and Morgan, 2011). Thus, it is necessary to continue to deepen the analysis of what measures, both internally and externally, could be considered to prevent, and therefore reduce, the likelihood of companies behaving irresponsibly.

The progress in CSIR study also requires empirical evidence to consolidate proposals on the concept, antecedents, consequences and/or moderators. It is not an easy task, given the nature of the question for research in the future empirical works. We understand that researchers face great complexity in obtaining primary data, since it is difficult to ask business leaders if the organizations that they manage conduct socially irresponsible behaviours. The use of secondary databases, although it may restrict the collection of information and limit the interpretation of results, can become an interesting future approach.

Notes

- 1. The Factiva database collected news on the VW company's emissions scandal as one of the industry's topical trends, with almost 1,800 news reports on the scandal and the company in less than two years, 900 of which were produced in the first three months.
- 2. The fall in the value of VW shares in the first three months was more than 35 per cent (*El País*, 25 November 2015).
- 3. Below are some of the CSR indices in which the company appears in 2014 according to its annual report. CDP Global 500 Climate Performance Leadership Index: listed (A); CDP Global 500 Climate Disclosure Leadership Index: listed, 99 points out of 100; CDP Supplier Climate Performance Leadership Index: Listed (A); Dow Jones Sustainability Index World: listed, 88 points out of 100; Dow Jones Sustainability Index Europe: listed, 88 points out of 100. Listed on ECPI Ethical Indices (Europe, EMU, Global), Ethibel Sustainability Index Excellence Europe, Euronext Vigeo Eurozone 120 Index, Global Compact 100, STOXX Global ESG Leaders Indices (Environmental, Social, Governance).
- 4. The literature often uses as synonyms the terms "ethical behaviour" and "socially responsible behaviour" and the same with the use of "irresponsible" and "immoral". In this work, we follow this approach.
- 5. This research was carried out in early October 2016.
- 6. A total of 39 per cent of the sample of articles study aspects not directly related to CSIR. This percentage includes articles that focus on the definition, antecedents and consequences of CSR; analysis of corruption in general; business ethics; analysis of the definition, meaning and scope of bribery; responsible leadership; and others (this last category includes articles that deal with, among others things, the study of social responsibility and ethics in universities and leadership, climatic change, research on international business (how to do business, history, consequences), economic, financial, social and environmental policies in different countries and consequences, the influence of political risk on companies, technological innovation, case studies on business strategies, religion, study of the role of NGOs, study of the cole of financial auditors, etc.)
- 7. These two articles appear in the *Social Responsibility Journal* and *International Journal of Retail & Distribution Management*, which have other impact indexes.
- 8. A total of 68 per cent of the work on the definition has been undertaken during the last five years and 92 per cent in the last ten years.
- 9. The question of intentionality is complex, as Iborra (2014) points out. Following Sen (1999), it is important to differentiate between intention and prevention. Thus, the intention of behaviour may not include damage or injury, but this does not exempt the unwanted consequences from being foreseeable and, therefore, involve liability.

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Entrepreneurial potential in less innovative regions: the impact of social and cultural environment

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Abstract

Purpose – The purpose of this paper is to analyze the role that the sociocultural, family and university environment play in the entrepreneurial intention of young people in a peripheral and less innovative region.

Design/methodology/approach – The authors adopted the perspective of the theory of planned behavior and made an empirical study with a sample of 1,064 Spanish university students who voluntarily participated in the GUESSS Project answering an online questionnaire. A methodology based on structural equations was used employing the partial least squares structural equation modeling estimation technique.

Findings – The results show that the university environment directly influences attitude, self-confidence and motivation, and indirectly the students' entrepreneurial intention. The social context also exerts a weak direct influence on the perceived attitudes or desires toward the option to start a business and indirectly on the intention.

Originality/value – The main contribution of this paper seems to confirm what previous literature highlighted in the terms of regional specificities on the link between innovation systems, the impact of entrepreneurial potential and economic development. In this sense, the university context can play an important role in generating improvements in the entrepreneurial intention's antecedents of young people with greater potential for innovation in peripheral regions. Therefore, when it comes to defining policies to improve entrepreneurship in these regions, it seems that the establishment of entrepreneurship education and motivation programs in universities is a very effective tool to increase perceived attitude toward the option to start a new business.

Keywords Innovation, Entrepreneurship, Entrepreneurial intention, GUESSS project, Outermost regions Paper type Research paper

JEL Classification — L26, R10, R11

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The impact of social and cultural environment

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EJMBE 1. Introduction

There are numerous studies in the literature that link innovation with economic development (Drucker, 1986; Damanpour and Scheneider, 2006; Schmiedeberg, 2008). However, this relationship is not direct, but is mediated by the institutional and organizational contexts of different regions, as well as the processes of generation and exploitation of knowledge driven by economic agents and, in particular, by entrepreneurs (Autio, 1998; Audretsch and Keilbach, 2004; Cooke, 2007; Huggins and Thompson, 2015).

Among these aspects, it is necessary to emphasize the important role played by the entrepreneurial potential of a territory. For investments in R&D and innovation to be transferred to economic growth, they must be accompanied by entrepreneurs with the capacity to access and exploit knowledge and generate innovation, creating demand and producing economic growth (Audretsch and Keilbach, 2004; González *et al.*, 2012; Guerrero and Peña-Legazkue, 2013; Castaño *et al.*, 2015; Guerrero *et al.*, 2016).

Several authors have shown that the different regional dimensions influence the promotion of entrepreneurship (Davidsson and Wiklund, 1997; Audretsch and Keilbach, 2004; Audretsch and Peña, 2012; Liñán and Fernández-Serrano, 2014; Guerrero *et al.*, 2016; García-Rodríguez *et al.*, 2016). From this point of view, it is not possible to perform homogeneous analyses and speak of "one-size-fits-all" regions (Asheim *et al.*, 2011) rather each region presents specific characteristics that determine the impact of investment in innovation on economic growth.

Therefore, following Asheim *et al.* (2011), regions can be classified into three categories: metropolitan, industrial and peripheral. The latter are characterized by a poorly developed regional innovation system, with a low presence of dynamic companies and knowledge-generating organizations. Following Huggins and Thompson (2015), peripheral regions present a deficit of educational institutions with a weak configuration of networks and links between companies and agents of regional innovation systems, especially between universities and research institutes. Therefore, in order to promote changes that favor innovation-based entrepreneurship as a driving force for growth in "peripheral" regions, we need to delve deeper into the analysis of the conditions of these environments and the motivations that drive entrepreneurship.

In this context, adopting an integrative perspective of the entrepreneurial process, according to the GUESSS project model, this paper aims to analyze the role that the sociocultural, family and university environment play in the entrepreneurial intention of young people in the Canary Islands region. This region is characterized as peripheral from the point of view of innovation, following the typology of Asheim *et al.* (2011).

Thus, the main contribution of this paper is to analyze the extent to which the university, social and family context, as well as the psychological factors of a peripheral region, affect the entrepreneurial intention of its population. This intention is especially important among the younger population segment, who have greater innovative potential, as in the case of a university population. This segment would be the key to transforming innovation into productive dynamics. Although descriptive analyses of this phenomenon have been made (Huggins and Thompson, 2015), empirical studies are still relatively scarce (García-Rodríguez *et al.*, 2016).

This paper begins by developing, from a theoretical perspective, the role of the university, family and sociocultural context in entrepreneurial intention, as well as the psychological factors framed in the theory of planned behavior (TPB), which constitute the theoretical foundation of the GUESSS model. Next, we present the empirical study and then the results and discussion. Finally, the most relevant conclusions are presented, as well as some limitations and future lines of research.

2. Entrepreneurial intention and regional economic development

The mediating role of entrepreneurship between investment in innovation and the economic development of a country or region is highly complex and may be limited by

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significant barriers and obstacles, not only those directly linked to the market, but also institutional and cultural constraints (Guerrero and Peña-Legazkue, 2013; Guerrero *et al.*, 2016). Overcoming these limitations is essential to gain access to the benefits of a virtuous circle that not only increases the levels of regional economic development through investment in innovation, but also by the subsequent improvements that a higher level of economic prosperity can bring in a potential innovative and entrepreneurial economy (González *et al.*, 2009; Audretsch and Peña, 2012). These limitations have a greater or lesser influence according to the kind of entrepreneur and entrepreneurial fabric in a country (Asheim *et al.*, 2011).

However, this entrepreneurial fabric is the result of multiple decisions made by individuals involved in a complex process that occurs over time (Gartner *et al.*, 1994; Kyrö and Carrier, 2005) and begins long before the moment the business is created, since there must be a process of prior planning to produce entrepreneurial intention. This intention, therefore, is prior to the creation of a business and, as in all behavior, can be considered its best predictor (Fishbein and Ajzen, 1975; Ajzen, 1991; Krueger and Brazeal, 1994).

From an integrative perspective and focusing on the university population, this process can be influenced, in addition to psychological factors, by other exogenous elements such as the university context, the family environment and the sociocultural context (Sieger *et al.*, 2014).

2.1 University context

Several studies show that the university environment is a key factor in motivating students to discover opportunities, as well as helping them to create knowledge-based or technology-based firms (Sánchez *et al.*, 2012).

This perspective is based on the conviction, mostly expressed in the literature since the 1980s, that an entrepreneur is not born but is made (Gartner *et al.*, 1994). Therefore, entrepreneurship is associated with a learning process and a possible change in the individual's abilities (Minniti and Bygrave, 2001). In this sense, the entrepreneur's capacities are not fixed or immovable personality traits or characteristics, but can change over time, develop and be learned through experience (Gibb, 1993; Bergmann, 2017). It is in this context that an explanatory approach to entrepreneurship based on the theory of attitudes (Robinson *et al.*, 1991) and identification of opportunities in studies such as those of McCline *et al.* (2000) or of Bergmann (2017) can be understood. The basic idea is that the concept of attitude in the individual is dynamic and changing and can respond to external incentives and, therefore, is much more adequate to explain entrepreneurship than the static conception associated with personality traits.

As mentioned, for investment in R&D and innovation to be transformed into economic growth, it is key to foster an entrepreneurial spirit oriented to innovation as a driving force for regional growth (Audretsch and Keilbach, 2004; González *et al.*, 2012; Guerrero and Peña-Legazkue, 2013; Castaño *et al.*, 2015; Guerrero *et al.*, 2016). In this sense, Sánchez *et al.* (2012) point out that after a slow period of internalization of the values of entrepreneurship in universities, these institutions are incorporating, as part of their philosophy, the capitalization of knowledge through the creation of businesses driven by the universities, themselves.

Considering that the educational environment, with its shared values and norms, especially in higher education, can affect entrepreneurial intentions and the subsequent start-up of firms (Guerrero *et al.*, 2016), the following hypotheses are proposed:

H1. The university context of students positively influences (a) personal attitude, (b) perceived subjective norms, (c) perceived control of their behavior, (d) their professional motivations and (e) the intention to create a business as a professional path following the completion of studies.

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2.2 Sociocultural contexts

Sociocultural values shared by members of a society play a fundamental role in the psychological functioning of individuals and have been the subject of research from multiple perspectives. In the entrepreneurial field, there is empirical evidence of the influence of certain social and cultural characteristics on individuals' beliefs and motivations in the face of entrepreneurial action (Lee *et al.*, 2006; Guerrero *et al.*, 2016). Among the different dimensions that influence the sociocultural environment, three stand out: type of society in relation to its' individualist vs collectivist "character", "distance to power" in reference to the acceptance or not of rules/rules and "aversion to risk" or degree of uncertainty (Hofstede, 2001).

Taking into account, Hofstede's (2001) social categories or groups, Liñán and Fernández-Serrano (2014) found that in developed countries, a greater cultural emphasis on individualistic values is associated with greater entrepreneurial activity derived from greater social legitimacy, so the decision to be an entrepreneur transcends personal beliefs and attitudes. On the contrary, when values related to aspects such as innovation and success conflict with the traditional cultural values, the lack of social recognition of entrepreneurship negatively influences entrepreneurial decisions. Similar studies have confirmed the significant influence that cultural differences can have on entrepreneurial intention (Liñán and Chen, 2009; Shinnar *et al.*, 2012; García-Rodríguez *et al.*, 2015).

Another of the sociocultural dimensions mentioned in the academic literature on entrepreneurship is associated with perceptions of the degree of authority or rank as well as the acceptance of norms and laws. Consequently, cultures in which members have a low-risk profile feel uncomfortable with little or non-structured situations and tend to avoid them (Shinnar *et al.*, 2012).

Lastly, there is risk aversion (uncertainty avoidance) or the degree in which members of a culture feel threatened by situations of uncertainty or ignorance (Hofstede, 2001). In this sense, Wennekers *et al.* (2007) found empirical evidence of the negative relationship between risk aversion and entrepreneurship.

Taking into account all this and assuming that entrepreneurial intention could be affected directly or indirectly by the sociocultural environment of the individual, the following hypotheses are proposed:

H2. The sociocultural context of students positively influences (a) personal attitude,(b) perceived subjective norms, (c) perceived control of behavior, (d) professional motivations and (e) the intention to create a business as a professional career after completion of studies.

2.3 Psychological factors, motivation and family context

In addition to the analyzed environmental factors, psychological factors must be integrated for a better understanding of the cognitive process of entrepreneurship (Sieger *et al.*, 2014). For this, the most used theoretical foundation is Ajzen's (1991) TPB. TPB has consolidated as the most used perspective in recent research to explain the entrepreneurial process from the combined influence of personal and social factors (Lima *et al.*, 2015; Shirokova *et al.*, 2016; Entrialgo and Iglesias, 2016).

According to TPB, entrepreneurial intention depends on three independent factors: personal attitude, perceived behavior control and subjective norms (Ajzen, 1991). "Personal attitude" refers to the degree to which individuals have a positive or negative personal assessment of themselves. "Perceived behavior control" represents the perceived ease or difficulty in controlling that behavior. This concept encompasses both the capacity for self-perception and the degree of perceived control. Finally, "subjective norms" reflects the perception of the degree of agreement or not on the part of relatives, friends and other

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persons of reference regarding the decision to adopt a certain behavior. Following Fishbein and Ajzen (1975), the three antecedents mentioned are sufficient to explain the intentions but their relative importance varies from one context to another.

According to this perspective, the decision to start a new business activity would depend on the perception of these three antecedent factors of intention. Consequently, the following research hypotheses are proposed:

- *H3.* A student's personal attitude toward entrepreneurship positively influences their intention to create a business as a professional career after completing studies.
- *H4.* The subjective norms perceived by the student influence positively in (a) personal attitude, (b) perceived behavior control and (c) intention to create a business as a professional opportunity after the end of their studies.
- *H5.* The perceived control of the student's behavior positively influences the intention to create a business as a professional path after completing studies.

Finally, the family context and motivation represent two aspects that in the entrepreneurship literature are also considered the determinants of intention. In fact, in the family context, numerous studies suggest that students with a history of entrepreneurial relatives may influence their career intention (Shirokova *et al.*, 2016). Therefore, the following hypotheses are proposed:

H6. The entrepreneurial experience of a student's family positively influences (a) personal attitude, (b) subjective norms and (c) the perceived control of their behavior to create a business as a professional path following completion of their studies.

Finally, some papers have emphasized the importance of integrating the role of motivation in the analysis of the entrepreneurial process. As well as mediating the relationship between the intention and the decision to be an entrepreneur (Carsrud and Brännback, 2011; Fayolle *et al.*, 2014), motivation can also be an explanatory element of entrepreneurial intention antecedents (Solesvik, 2013; Hui-Chen *et al.*, 2014). Motivation theories linked to entrepreneurship can be divided into two main areas. There are "necessity theories" that are based on the existence of internal stimuli in the individual (hunger, fear, etc.) and guide behavior toward the reduction of the resulting tension and there are "incentive theories," which start from the individual developing behaviors or from the pursuit of external objectives and prizes (Carsrud and Brännback, 2011; Fayolle *et al.*, 2014).

Therefore, the professional motivation of individuals based on their expectations and preferences represent the aspects that could positively influence entrepreneurial intention, both directly and indirectly through their antecedents. Therefore, it is possible to propose the following hypothesis:

H7. Students' motivation positively influences (a) personal attitude, (b) perceived subjective norms, (c) perceived control of behavior and (d) the intention to create a business as a professional path after completion of studies.

3. Empirical study

3.1 Study context

Spain's R&D expenditure in 2013 was equivalent to 1.24 percent of its GDP, well below the OECD (2.4 percent) and EU-28 (1.92 percent). In addition, this figure for Spain puts it at levels below to those of 2007, a fact that contrasts with what has happened in the countries of reference, where R&D efforts have continued to increase. As a result, the gap between Spain and reference regions has widened: if in 2010 Spanish R&D was 0.95 percentage

The impact of social and cultural environment points from the OECD average and 0.49 from the EU average-28, in 2013 these distances were 1.15 and 0.68 points, respectively (Fundación COTEC, 2015, p. 24).

In the Spanish regional context and in terms of R&D effort, the Canary Islands ranks as second from the bottom regarding R&D spending, as the amount allocated to this activity is equivalent to only 0.52 percent of GDP, only ahead of the Balearic Islands (Fundación COTEC, 2015). Although in other less applied indicators, such as the case of scientific production in internationally disseminated journals, the situation in the Canary Islands is slightly better than in the previous variable. For example, the Canary Islands achieved a percentage of academic papers in the Spanish context in the period 2009-2013 of 2.88 percent, placing it in the 12th place (COTEC Foundation, 2015). However, the fact is that in general terms R&D in the region is very weak. In addition, the situation of the regional innovation system in the Canary Islands is characterized by being highly unbalanced, with a few high-level nodes but with few results, and a high dependence on public institutions. These institutions represent a much higher percentage in the system than other Spanish regions with a lack of productive fabric capable of absorbing R&D results. All this means that, according to the typology of Asheim *et al.* (2011), the Canary Islands can clearly be designated as a peripheral region from the point of view of innovation.

3.2 Measurement scale and research model

To analyze the influence of the social and university environment on entrepreneurial intention, the GUESSS international project reference model is used. This project is led by the Swiss Research Institute of Small Business and Entrepreneurship of the University of St Gallen (Sieger *et al.* 2014). The theoretical framework that underlies the questionnaire items is unique to all participating universities and is based on Ajzen's (1991) TPB, focusing on career choice intentions in general and on entrepreneurial intentions in particular. Table I of the results section shows the description of the items used in the questionnaire to measure each of the first- and second-order constructs of the model.

The model used in this study is shown in Figure 1. It is an adaptation of the proposal in the GUESSS project. This model specifies 11 first-order constructs and two second = order constructs (Univ_Context and Soc_Context).

3.3 Sample and data collection

Since the fundamental purpose of the GUESSS project is to understand the entrepreneurial intentions and activities of university students, the empirical study uses a sample of students from the University of La Laguna, who voluntarily answered a questionnaire. This type of sample is very recurrent in empirical research applied to entrepreneurship, since university students represent a segment of the population with high entrepreneurial potential (Robinson *et al.*, 1991; Souitaris *et al.*, 2007). It was supported by the vice-rectorate of student affairs who promoted the research among the students. Data collection was through an online questionnaire between October and December 2013 (sixth edition of the GUESSS project and the first in which the Spanish universities participated). The questionnaire, translated by experts in entrepreneurship, contains more than 240 questions distributed in 12 blocks. For the purposes of this research, we worked with 54 items for variables measured on a seven-point Likert scale, except for the Fam_Exper construct.

From the number of students enrolled in the academic year 2013-2014, a response rate of 7 percent was estimated, which led to a sample of 1,461 questionnaires. After debugging and a preliminary analysis, 397 questionnaires with a response rate of less than 5 percent were eliminated, so the final sample was reduced to 1,064 valid questionnaires for the analysis. By gender, the sample consisted of 34 percent men and 66 percent women with an average age of 21.

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| Items | First-order constructs | λ | CR ^a | AVE ^a | R^2 | The impact of |
|-------------------|--|-----------------|-----------------|------------------|-----------|----------------------|
| Please | indicate your level of agreement with the following statements $(1 = strongly)$ | disagr | ree, 7= | = strongi | ly agree) | cultural |
| EI1 | I am ready to do anything to be an entrepreneur | 0.87 | 0.98 | 0.86 | 0.65 | environment |
| EI2 | My professional goal is to become an entrepreneur | 0.94 | | | | |
| EI3 | I will make every effort to start and run my own firm | 0.96 | | | | 169 |
| E14 F15 | I all determined to create a firm in the future | 0.90 | | | | 100 |
| EI6 | I have the strong intention to start a firm someday | 0.91 | | | | |
| 110 | (2) Attitude | 0.00 | | | | |
| A1 | Being an entrepreneur implies more advantages than disadvantages to me | 0.92 | 0.98 | 0.90 | 0.47 | |
| A2 | A career as entrepreneur is attractive for me | 0.96 | | | | |
| A3 | If I had the opportunity and resources, I would become an entrepreneur | 0.96 | | | | |
| A4 | Being an entrepreneur would entail great satisfaction for me | 0.97 | | | | |
| Aə | Among various options, I would rather become an entrepreneur | 0.96 | | | | |
| If you negati | would pursue a career as an entrepreneur, how would people in your enviro- vely, 7 = very positively) | nment | react? | (1 = ve) | ry | |
| 0 | (3) Subjective norms | | | | | |
| SN1 | Your close family | 0.97 | 0.98 | 0.95 | 0,40 | |
| SN2 | Your friends | 0.99 | | | | |
| SN3 | Your fellow students | 0.97 | | | | |
| Please | indicate your level of agreement with the following statements $(1 = strongly (4)$ Perceived behavior control | disagr | ree, 7= | strong | ly agree) | |
| PBC1 | I am usually able to protect my personal interests | 0.95 | 0.98 | 0.87 | 0.75 | |
| PBC2 | When I make plans, I am almost certain to make them work | 0.95 | | | | |
| PBC3 | I can pretty much determine what will happen in my life | 0.91 | | | | |
| PBC4 | For me, being an entrepreneur would be very easy | 0.92 | | | | |
| PBC5 | If I wanted to, I could easily pursue a career as entrepreneur | 0.90 | | | | |
| PBC0 PBC7 | If I become an entrepreneur, the chances of success would be very high | 0.93 | | | | |
| $(1 - \lambda)$ | In Proceeding and enablement, the enabled of success would be very high $T_0 = 2 - V_{0S}$ father $3 - V_{0S}$ mother $4 - hath$ | 0.00 | | | | |
| (1 - 1) | (5) Family background | | | | | |
| F1 | Are your parents currently self-employed? | 0.92 | 0.97 | 0.87 | | |
| F2 | Are they majority shareholders of a firm? | 0.94 | | | | |
| F3 | Do you have other family members who are self-employed and/or | | | | | |
| E4 | majority shareholders of a private firm? | 0.94 | | | | |
| F4 | shareholders of a private firm? | 0.95 | | | | |
| | shareholders of a private mini: | 0.55 | | | | |
| How is at all, | nportant are the following factors when you are to decide on your future can 7=very important) | reer po | ath? (1 | = not in | nportant | |
| 1/10 | (6) Career motives | 0.01 | 0.05 | 0.40 | 0.05 | |
| MI0 M5 | To take advantage of your creative needs | 0.61 | 0.85 | 0.48 | 0.05 | |
| M6 | To have nower to make decisions | 0.79 | | | | |
| M7 | To have authority | 0.72 | | | | |
| M8 | To realize your dream | 0.57 | | | | |
| M9 | To create something | 0.69 | | | | |
| Please | indicate the extent to which you agree to the following statements about the un | iversit <u></u> | y envir | onment. | (1 = not | |
| ш ш, | (7) University environment (atmosphere) | | | | | |
| UE1 | The atmosphere at my university inspires me to develop ideas for new | | | | | Table I. |
| | businesses | 0.89 | 0.93 | 0.81 | | Items and results of |
| | | | | | | the analysis of the |
| | | | | (cor | ntinued) | and validity |

| EJMBE 26.2 | Items First-order constructs | С | CR ^a | AVE ^a | R^2 |
|---------------|---|-------------------------|-------------------------|--------------------------------------|----------------------------|
| | UE2 There is a favorable climate for becoming an entrepreneur at my university 0.9 UE3 At my university, students are encouraged to engage in | 4 | | | |
| | entrepreneurial activities 0,8 | 7 | | | |
| | (8) Learning progress The courses and offerings Lattended | | | | |
| 170 | UL1 increased my understanding of the attitudes, values and | | | | |
| | motivations of entrepreneurs 0.9 | 0 0 | .96 | 0.81 | |
| | UL2 increased my understanding of the actions someone has to take to | | | | |
| | Start a business U.S. | 3 | | | |
| | UL4 enhanced my ability to develop networks 0.8 | 59 | | | |
| | UL5 enhanced my ability to identify an opportunity 0.8 | 7 | | | |
| | Indicate your level of agreement with the following statements (1 = strongly disagree, 2 Social context (9) In-group collectivism^b In my society, IGC1, children take pride in the individual accomplishments of their parents 0.9 | '=st | trong).97 | ly agree) 0.89 | |
| | IGC2, parents take pride in the individual accomplishments of their children 0.9 | 7 | | | |
| | IGC3, aging parents generally live at home with their children 0.9 | 2 | | | |
| | 1004, children generally live at nonie with their parents until they get married 0.3 | 2 | | | |
| | For the following questions, please indicate which of two opposing answers (a or b) you (10) Power distance ^b | ı agr | ee m | ore: | |
| | PD1 In my society, a person's influence is based primarily on: (a) Ability and contribution to society; (b) Authority of one's position 0.9 | 1 0 | .94 | 0.78 | |
| | PD2 In my society, followers are expected to: (a) Obey leaders without question: (b) Question leaders when in disagreement 0.8 | 6 | | | |
| | PD3 My society has rules or laws to cover: (a) Almost all situations; (b) Very few situations 09 | 01 | | | |
| | PD4 In my society, power is: (a) Concentrated at the top; (b) Shared | - | | | |
| | throughout society 0.8 (11) Uncertainty avoidance ^b | .6 | | | |
| | UA1 orderliness and consistency are stressed, even at the expense of | | | | |
| | experimentation and innovation 0.9 | 5 0 | .95 | 0.83 | |
| | UA2, most people lead highly structured lives with few unexpected events 0.9 UA3, societal requirements and instructions are spelled out in detail so | 5 | | | |
| | citizens know what they are expected to do 0.9 | 4 | | | |
| | Second-order constructs | 1 | | | |
| | University context | | | | |
| | UE University atmosphere 0.8 UL Learning progress 0.8 | 2 0. 7 | 97 | 0.71 | |
| | Social context 0.5 IGC In-group collectivism 0.5 PD Power distance 0.5 UA Uncertainty avoidance 0.5 | 15 0. 16 |).83 | 0.91 | |
| Table I. | Notes: ^aCR, composite reliability; AVE, average variance extracted; ^bitems from ^aGlobal Leadership and Organizational Behavior Effectiveness (GLOBE) in which measured with three dimensions of Hofstede: in-group collectivism, power distance ar Source: Own elaboration | socia cultu nd ur | al con ural ncert | ntext" are dimension ainty avo | e from ns are idance |

4. Results and discussion

For the predictive analysis of entrepreneurial intention of participating students, a methodology based on structural equations was used employing the partial least squares (PLS) structural equation modeling estimation technique. The PLS technique



Theoretical model and hypothesis

Source: Adapted from the theoretical model of the GUESSS project (Sieger *et al.*, 2014)

(also called flexible modeling) is more oriented to predictive (non-causal) analysis and has been used in numerous works applied in different fields of knowledge for its metric properties for validation of measurement scales and confirmation of hypotheses. In the particular field of entrepreneurship literature, some of the more recent works using analytical techniques have been based on structural equations (Castaño *et al.*, 2015; Bergmann, 2017; Guerrero *et al.*, 2016). The use of these equations is appropriate in studies in which the theoretical foundations are not yet well defined and, therefore, the theoretical framework plays a guiding role in the establishment of conjectural relations between constructs whose measurements are not very developed. The estimation of the parameters representing the measurements and the multiple regression path relationships shown in Figure 1 is performed using the PLS technique, since this technique best completes the analysis of main components and the one of linear regression.

All the unobserved latent variables are measured with reflective indicators as they reflect the theoretical construct they represent, giving rise to observable variables that are reflective (Sarstedt *et al.*, 2014). Only the construct represented by the "family environment" to measure the latent variable entrepreneurial experience is formative, since this construct is defined by its four indicators (see Table I).

Data analysis was performed with the SmartPLS 2.0 software that allows an evaluation of the reliability and validity of the model in a first phase, and an evaluation of the structural relationships of the model in a second. For the estimation of the second-order constructs, the hierarchical components method was used, since the number of indicators in each dimension is equivalent and they are reflective.

4.1 Measurement model: reliability and validity

For the analysis of the individual reliability, the loadings of the indicators with their respective construct were examined. Values between 0.6 and 0.7 are considered acceptable in exploratory research and, above 0.7 as being very satisfactory (Sarstedt *et al.*, 2014). Nevertheless, authors such as Chin (1998) argue that in the initial stages of the development of a scale, values greater than 0.5 could be accepted.

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In this paper, following the criteria of Sarstedt *et al* (2014), we opted to eliminate four items with factor loadings lower than 0.6 and whose exclusion, although affecting the content validity of the construct they represent, does not theoretically produce significant changes in the specification of the model. In particular, the items of the motivation construct (Car_Motiv) related to the following aspects are eliminated: "To have a job that involves a challenge" (M1, $\lambda = 0.48$); "To have exciting work" (M2, $\lambda = 0.51$); "Freedom" (M3, $\lambda = 0.52$) and "Independence" (M4, $\lambda = 0.56$). A second estimation of the parameters of the respecified model confirms the individual reliability of the first-order indicators with values greater than 0.6 in all cases except for the item "Fulfill your dream" (M8, $\lambda = 0.57$), which was not eliminated to avoid the possible negative effects on the predictive validity of the measures of the construct and because its loading is substantially higher than the minimum suggested by Chin (1998).

The internal consistency of the constructs was then evaluated through the composite reliability indicator (ρ_c). All constructs reached values between 0.83 (Soc_Contex) and 0.98 (SN and PBC), always above the optimum level set at 0.7 (Chin, 1998; Fornell and Larcker, 1981).

The convergent validity of the constructs was evaluated by the value of the average variance extracted (AVE). An acceptable value is 0.50 or higher since it indicates that, on average, the construct explains more than 50 percent of the variance of its items. In the cases analyzed, all the constructs of the model reached a value of AVE superior or very close to 0.5 (Fornell and Larcker, 1981). Table I summarizes the results obtained for the reliability and validity analysis of the first- and second-order constructs.

The analysis of the discriminant validity of the constructs was performed using the criterion established by Fornell and Larcker (1981). To do this, it was verified that the square root of the AVE of each construct that appears in the diagonal of Table II is greater than the correlations between constructs that are shown in the inferior part of this diagonal.

Additionally, this result was corroborated by the analysis of the correlations between the scores for each construct and those for the items belonging to other constructs or analysis of cross-loadings. This result confirms that all indicators have a greater loading on their own construct than on any other construct included in the structural model (Hair *et al.*, 2014).

4.2 Evaluation of the structural model

The evaluation of the structural model allows an analysis of the extent to which the predictive relationships proposed in the model are consistent with the available data. For the interpretation of the structural model, two basic indices are used: the square of the

| | ATT | Car Motiv | ENT INT | Fam Exp | IGC | PBC | PD | SN | UA | UE |
|-----------|---|-----------|---------|---------|-------|-------|-------|-------|-------|-------|
| ATT | 0.951 | | | | | | | | | |
| Car Motiv | 0.231 | 0.692 | | | | | | | | |
| ENT INT | 0.807 | 0.280 | 0.932 | | | | | | | |
| Fam Exp | 0.386 | 0.071 | 0.259 | 0.936 | | | | | | |
| IGC | 0.393 | 0.096 | 0.265 | 0.909 | 0.943 | | | | | |
| PBC | 0.689 | 0.129 | 0.537 | 0.575 | 0.571 | 0.930 | | | | |
| PD | 0.332 | 0.030 | 0.218 | 0.819 | 0.851 | 0.499 | 0.886 | | | |
| SN | 0.656 | 0.078 | 0.488 | 0.625 | 0.622 | 0.863 | 0.542 | 0.975 | | |
| UA | 0.344 | 0.057 | 0.237 | 0.801 | 0.842 | 0.506 | 0.916 | 0.533 | 0.916 | |
| UE | 0.113 | 0.164 | 0.119 | 0.045 | 0.058 | 0.083 | 0.064 | 0.068 | 0.089 | 0.901 |
| UL | 0.154 | 0.183 | 0.197 | 0.047 | 0.040 | 0.080 | 0.048 | 0.040 | 0.072 | 0.429 |
| Note: The | Note: The square root of AVE values is shown on the diagonal and printed in italics | | | | | | | | | |

Table II. Discriminant validity coefficient of multiple correlation (R^2) and the standardized path coefficients (β). According to Sarstedt *et al.* (2014), as a general rule, R^2 values equal to 0.75, 0.50 and 0.25 can be interpreted as levels involving substantial, moderate and weak predictive power, respectively. However, Chin (1998) sets somewhat lower limits of 0.67, 0.33 and 0.19 for each of the three levels of predictive potential.

The results of the structural model are shown in Figure 2 in which it is observed that the latent variable ENT_INT has high predictive power with an R^2 value equal to 0.70. In the case of attitude and perceived behavior control, moderate values of 0.29 and 0.24, respectively were reached. As for the subjective norms and Car_Motiv constructs, the amount of their variance that was explained by the model was very weak, with values of 0.09 and 0.05, respectively.

The results of the analysis of the significance and relevance of the structural relationships of the model with a nonparametric bootstrap procedure with 5,000 observations revealed that 11 of the 22 structural relationships presented in the model are significant (p < 0.05) and seven reached a positive value for the standardized path coefficient that as greater than 0.2. Table III provides an overview of the total effects and their level of significance.

The quality of the global model is analyzed by the GoF test (Tenenhaus *et al.*, 2005), which represents the geometric mean of average commonality and the average R^2 (for endogenous constructs), whose value is bounded by 0 and 1. In this paper, the GoF value obtained for the complete model was 0.69, which exceeds the minimum reference value, thus confirming the substantial explanatory power of the model:

$$GoF = \sqrt{\overline{AVE} \times \overline{R^2}}$$

To analyze the predictive relevance of the model-dependent constructs, the Stone and Geisser (Q^2) test was performed considering that, as a general rule, values of Q^2 greater than 0 indicate that the predictive capacity is acceptable (Chin, 1998). In this study, the cross-validated redundancy approach for the calculation of Q^2 (Hair *et al.*, 2014) was used. The blindfolding procedure was performed with a default distance of 5 and the values obtained in all endogenous constructs were greater than 0 (ENT INT: 0.56; ATT: 0.41; SN: 0.38, PBC: 0.62 and Car_Motiv: 0.2), which confirms the predictive relevance of the model.



Notes: **p*<0.05; ***p*<0.01; ****p*<0.001 **Source:** Own elaboration

Figure 2. Relationships of structural model analyzed

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| EJMBE 26.2 | Hypothesis | β | Sig. | Total effect | <i>t</i> -statistics | R^2 | Q^2 |
|--|---|---|----------------------|----------------------|---|-------|-------|
| <u>174</u> | Entrepreneurial intention ATT \rightarrow ENT INT Car Motiv \rightarrow ENT INT PBC \rightarrow ENT INT SN \rightarrow ENT INT Soc Contx \rightarrow ENT INT Univ Contx \rightarrow ENT INT Univ_Contx \rightarrow ENT_INT | $\begin{array}{c} 0.74 \\ 0.10 \\ 0.04 \\ 0.03 \\ 0.02 \\ 0.04 \end{array}$ | *** ** * ** | 0.40 0.12 0.25 | $20.29 \\ 2.70 \\ 1.04 \\ 0.78 \\ 0.60 \\ 1.32 \\ 2.30 \\ 4.77$ | 0.70 | 0.56 |
| | Attitude Car Motiv \rightarrow ATT Fam Exp \rightarrow ATT SN \rightarrow ATT Soc Contx \rightarrow ATT Univ Contx \rightarrow ATT | 0.35 -0.07 0.23 0.08 0.13 | *** *** * | | $6.69 \\ 0.75 \\ 4.03 \\ 1.75 \\ 2.48$ | 0.29 | 0.41 |
| | Subjective norms Car Motiv \rightarrow SN Fam Exp \rightarrow SN Soc Contx \rightarrow SN Univ Contx \rightarrow SN | $0.25 \\ -0.08 \\ 0.06 \\ 0.08$ | *** | | 4.59 0.73 1.05 1.43 | 0.09 | 0.38 |
| | Perceived behavior control Car Motiv \rightarrow PBC Fam Exp \rightarrow PBC SN \rightarrow PBC Soc Contx \rightarrow PBC Univ Contx \rightarrow PBC | $0.32 \\ -0.07 \\ 0.23 \\ 0.00 \\ 0.12$ | *** *** | | 6.27 0.67 3.60 0.02 2.20 | 0.24 | 0.62 |
| Table III. Results of the analysis of the structural model | Professional motivation Soc Contx \rightarrow Car Motiv Univ Contx \rightarrow Car Motiv Notes: * $p < 0.05$; ** $p < 0.05$ Source: Own elaboration | 0.08 0.21 1; ****p < 0.00 | *** 1 | | 1.35 3.63 | 0.05 | 0.02 |

4.3 Discussion

The result of the data used shows that in the theoretical model proposed in the GUESSS project and applied to a sample of university students, 50 percent of the relationships between the constructs of this model can be confirmed. In general, university environment and learning directly influence attitude (*H1(a)*, $\beta = 0.13$, p < 0.05), self-confidence (*H1(c)*, $\beta = 0.12$, p < 0.05) and motivation (*H1(d)*, $\beta = 0.21$, p < 0.001) and indirectly, although moderately, students' entrepreneurial intention ($\beta = 0.25$). The social context also exerts a weak direct influence on the perceived attitudes or desires toward the option to start a business (*H2(a)*, $\beta = 0.08$, p < 0.05) and indirectly on the intention ($\beta = 0.12$).

However, the same university environment does not significantly influence students' perceptions of family and close friends' support with their idea of setting up a firm. Experience in the entrepreneurial field of relatives or friends does not seem to exert any significant influence on the determinants of entrepreneurial intention by students (H6(a)-(c)), unlike other works in which a positive and significant relationship between professional experience and the perception of opportunities on the part of the students has been shown (Bergmann, 2017).

As to the motivation of these students to start professional careers as entrepreneurs, the results show the strong and positive influence of motivation on attitude (H7(a), $\beta = 0.35$, p < 0.001), family support (H7(b), $\beta = 0.25$, p < 0.001), and, in a weaker way, on their entrepreneurial intention (H7(d), $\beta = 0.01$, p < 0.01) and on the confidence perceived by the students themselves (H7(d), $\beta = 0.01$, p < 0.01).

5. Conclusions, limitations and future lines of research

In this paper, new evidence is presented about the positive influence on entrepreneurial intention of university students of dimensions such as the university and sociocultural context of a region such as the Canary Islands, considered peripheral from the point of view of innovation, according to the typology of Asheim *et al.* (2011). Such influences, in line with the results of Cooke (2007) and Huggins and Thompson (2015), could contribute to economic growth, development and innovation.

This paper analyzes entrepreneurial intention in a sample of university students from the Canary Islands. The Canarian archipelago is a region that, according to Asheim *et al.* (2011), would be framed in the typology of "peripheral" region. These regions are characterized by a system of regional innovation that is poorly developed and with a low presence of both dynamic companies and knowledge-generating organizations. The case of the Canary Islands stands out as this region has an entrepreneurship rate in terms of the perception of business opportunities that places the archipelago above the national average (Peña *et al.*, 2016).

This contextual approach makes sense insofar as in the field of innovation it is not possible to carry out homogeneous analyzes and speak of "one size fits all" (Asheim *et al.*, 2011). Instead, each region may have specific characteristics that determine the impact that investments in innovation generate on economic growth and on the way entrepreneurial potential is translated into entrepreneurial intention.

The results highlight the great importance that attitudes have as a direct antecedent of the entrepreneurial intention of university students. In this sense, the university context, that is to say, an environment and climate conducive to innovation, creativity and entrepreneurship existing in universities have great importance in the formation of entrepreneurial attitudes. This impact seems to be conveyed through changes in the reasons for choosing future professional careers. In this sense, this variation of professional motivations directly impacts on the attitudes of young people, modifying them and generating a change in entrepreneurial intention. However, there is also an important indirect effect on the attitudes through subjective norms, so that changes in the reasons for choosing a future professional career would alter the perception of the opinions of others (family, friends, etc.) regarding the possible decision to be an entrepreneur.

To the contrary, it is emphasized that, although there is a direct and statistically significant relationship between the social context and entrepreneurial attitude, it is very weak. Moreover, there is no other significant relationship between social context and other entrepreneurial intention antecedents. Thus, it appears to confirm what Asheim *et al.* (2011) highlighted in terms of regional specificities regarding the link between innovation systems, the impact of entrepreneurial potential and economic development. In this sense, it seems that in the so-called peripheral regions, the university context can play an important role in generating improvements in the entrepreneurial intention of young people with greater innovative potential.

Therefore, when it comes to defining policies to improve entrepreneurship in these regions, it seems that the establishment of entrepreneurial education and motivation programs in universities is a highly effective tool (Souitaris *et al.*, 2007).

5.1 Limitations and future lines of research

To conclude this exploratory analysis, the main limitations and future lines of action are indicated. First, as in most entrepreneurial intention studies, data are analyzed from a

The impact of social and cultural environment sample in which a single (cross-sectional) data collection is carried out. This allows robust but restricted conclusions to be drawn about the predictive relationships established in the model. Therefore, in the future it would be interesting to repeat the process of data collection at different times. In the field of entrepreneurship, some studies have incorporated the temporal dimension in a longitudinal analysis to give greater amplitude and depth to the analysis (Van Gelderen *et al.*, 2015).

Second, the paper limits its scope to university students on the Canary Islands, a peripheral region in the European context. As a future line of research and to have a more complete view of the phenomenon analyzed, it would be advisable to extend this research to the national and international level, both to similar regions and to industrial and metropolitan ones, with data from the GUESSS survey (Guerrero and Peña-Legazkue, 2013; Castaño *et al.*, 2015).

Third, this research is carried out with the items present in the GUESSS questionnaire, which restricts the content validity of the constructs of the analytical model to these items. Therefore, it would be interesting to incorporate in the measurement instrument other elements of the university and sociocultural environment that have not been taken into account in this paper. Among them, we can mention the potential of university spin-off creation and its impact in terms of productivity and profitability of R&D and innovation activity (Sánchez *et al.*, 2012).

Finally, in line with Van Gelderen *et al.* (2015), it would be interesting to investigate to what extent entrepreneurial intention shown by the participants becomes effectively an action and subsequent new business start-up, evaluating "precipitating events" or circumstances that encourage potential entrepreneurs to start or not a new business.

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Research and technology organizations' mobilizers of the regional environment

Competitive strategies

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Abstract

Purpose – The purpose of this paper is to propose a contingent model that facilitates knowledge of the strategies followed by the research technology organizations (RTOs) of Valencia and the Basque Country, Spain, to adapt to the turbulence of their environment.

Design/methodology/approach – The research includes context, organizational and results variables and identifies some barriers that the RTOs encounter in collaborating with SMEs and also the best practices they follow to develop competitive advantages. The methodology used consisted of applying the proposed model to the 27 RTOs of both autonomous regions; a factor analysis was then performed to determine whether there exist groups of related (correlated) variables; finally, the authors proceeded to carry out a hierarchical cluster analysis to observe how the 27 RTOs are distributed according to their ability to adapt and respond to environmental turbulence.

Findings – The technological policy must consider the characteristics of each region to propose more efficient and equitable mechanisms that allow the RTOs to face new challenges.

Originality/value – This study proposes a theoretical model suitable for RTOs to respond to environmental changes, to the current economy globalization and to cope with new challenges. This proposal means that RTOs must manage an appropriate combination of key factors, including the development of more proactive innovation strategies, an organic organizational structure to relate better with other innovation agents and universities, which help them to work more efficiently with SMEs and to obtain a higher innovative performance.

Keywords Innovation strategies, Research technology organizations (RTOs), Turbulent environment,

Challenges of the research technology organizations

Paper type Research paper

1. Introduction

The research technology organizations (RTOs) have evolved by implementing institutional reforms in order to improve their competitiveness and their contribution to innovation processes (Preissl, 2006). In Spain, the austerity policies and budget reductions, in addition to changes in traditional industries and globalization of markets, are questioning the sustainability of



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This paper has its origin in the DCOTIQ project developed between 2008 and 2011, funded by the Ministry of Science and Innovation and with the participation of the Polytechnic University of Valencia (UPV), the University of Mondragon (MU) and the IDEKO institute.

RTOs (FEDIT, 2012). For this reason, it is necessary that RTOs develop new approaches that allow them to overcome these difficulties (Marco and López, 1996; Holmström, 2006).

For this study, two regions were selected on the basis of the characteristics of their own business environments and RTO models: Valencian Community and the Basque Country. These communities are an interesting case for a comparative study in which the data of more than 80 percent of RTOs from both communities were analyzed. The two autonomous communities are facing these changes in the environment in different ways. Valencia, which through REDIT Technological Institutes network integrates 14 RTOs, is the region with the highest accumulated debt, and has seen maximum reduction in the staff of the RTOs and has been forced to close some of the RTOs. It therefore needs to reorganize the network to reduce costs (REDIT, 2011) and, therefore, make it sustainable and more competitive. Meanwhile, the Basque Country, with 19 RTOs integrated on two technology platforms, TECNALIA and IK4, is developing short-term strategies to strengthen its networks and internationalize them. (Comisión Europea, 2011). In this context, our paper sets out a question about what should RTOs do to adapt or respond to the changes in their environment? The goals of this paper, therefore, are proposing a contingent model that connects context, organizational and results variables and identifying barriers that influence unemployment and best practices of the RTOs.

This paper is divided into three parts. In the first part, an analytical framework of RTOs is developed, where a review is carried out of the academic literature that has studied this phenomenon in order to identify the variables that support the analysis and subsequent proposal of a model that explains the relation between them. In the second part, a model and research hypotheses are discussed. And in the third part, the methodology used and the results are described. Finally, the conclusions of the study are presented and discussed.

2. Analytical framework

A review of the literature on RTOs, which supports the proposal of a theoretical model to study the RTOs, is presented below.

2.1 RTOs: their role, strategy and new challenges

The RTOs were created as non-profit institutions, by means of private initiative and public support (Rush *et al.*, 1996; Santamaría *et al.*, 2002), or they were promoted by groups of related companies with common interests (Berger and Hofer, 2011; Leijten, 2007). They are intermediate institutions or interface structures, which support and strengthen the innovative activities of enterprises (Albors-Garrigós *et al.*, 2014; Aström *et al.*, 2008) through an offer of complementary technological training services on training, information, intermediation, technical advice, consultation and R + D + i services (Hervás *et al.*, 2012).

The RTO model is generally constituted by public capital and private resources derivative from strategic projects with client companies (Santamaría *et al.*, 2002). The RTOs play a very significant role in the R&D activities (Arnold *et al.*, 2010; Bienkowska *et al.*, 2010), and are considered as the main agent of territorial innovation (Albors-Garrigós, Zabaleta and Ganzarain, 2010; Mas-Verdú *et al.*, 2008; Martínez-Gómez *et al.*, 2009; Tann *et al.*, 2002).

The RTOs must have a clear strategic vision, which helps to meet the needs for innovation in the local industry (Arnold *et al.*, 1998; Leitner, 2005). This is the reason they use strategic planning as a key management tool (Rush *et al.*, 1996; Arnold *et al.*, 1998; Aström *et al.*, 2008).

The RTOs have several challenges to overcome: to strengthen their internal capacities, through the convergence of different technologies and disciplines (Leijten, 2007; Leitner, 2005), build networks to cope with reduced funding and the cost of the research (Loikkanen *et al.*, 2011), and improve their relation with universities and other innovation actors (Callejón *et al.*, 2007; Mrinalini and Nath, 2008).

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2.2 Technological environment and competitiveness: strategies and organizational factors to cope with the turbulence of the environment (the contingent approach)

Organizations are constantly faced with the turbulence of the environment, which is the result of the convergence between dynamism, uncertainty and complexity (Tidd, 2001). Some authors (Emery and Trist, 1965; Silverblatt and Korgaonkar, 1987) have exposed that the internal differences in management models of the organizations can contribute to their failure and the way they face the turbulence of the environment. Other studies consider that the turbulence of the environment responds to external factors, such as demographic changes (McCann and Selsky, 1984), changes in the policies that regulate the markets and economic cycles, (Dwyer and Welsh, 1985) and technological changes (Taylor and Taylor, 2012), which generate technological turbulence and uncertainty associated with the adoption of technology (Freeman and Soete, 1999).

To cope with the turbulence of the environment, the contingent theory (Burns and Stalker, 1961; Khandwalla, 1972; Terreberry, 1968) proposes a more flexible or organic organizational structure, which is characterized by a low degree of formalization, horizontal communication and decentralized decision making. Another alternative for this theory is the strategic change. The reactive companies perceive changes and uncertainty, but do not respond effectively to them; thus the development of proactive and more flexible strategies is required (Teece *et al.*, 1997), which allow re-orientation and adapting to changes of the environment (Gordon *et al.*, 2000). Following this path, an organization will succeed to the extent that it can adapt to changes of its environment and survive. An organization strengthened through this approach can take advantage of the opportunities the environment offers.

Following this approach, the RTOs adapt more quickly to changes in the environment. The proper development of their activities will depend on strategic focus and organizational design (Modrego-Rico *et al.*, 2005), in which human resources play a key role (Silva and Ramírez, 2006). Hence, RTOs should promote the capabilities of their staff (Rush *et al.*, 1996; Mrinalini and Nath, 2008) and find a balance between the key variables such as environment, organizational structure and strategy in order to achieve optimal performance (Deutsch *et al.*, 2009; Rush *et al.*, 1996).

In this context, the most appropriate strategies for the RTOs are those aimed at boosting changes in the industry, through convergence and diversification of their technological offer (Leijten, 2007; Leitner, 2005), the strategies which help to overcome market failures (Modrego-Rico *et al.*, 2009), the strategies that allow RTOs to work effectively with SMEs (Aström *et al.*, 2008; Barge-Gil *et al.*, 2011), improve their relation with other innovation actors (Mas-Verdú *et al.*, 2008) and the ones which facilitate the internationalization process of their services and contribute to their sustainability (Berger and Hofer, 2011).

2.3 Relationships of the RTOs with other innovation agents: best practices

As part of the policy of promoting innovation, the RTOs have become an essential tool to reduce market failures that occur by information asymmetries (Barge-Gil and Modrego-Rico, 2008). In certain circumstances, the RTOs stand as key players in the territorial innovation system responsible for disseminating knowledge and providing support services and connectivity between SMEs and other innovation actors (Tann *et al.*, 2002; Martínez-Gómez *et al.*, 2009).

The RTOs are of vital importance to overcome the systemic failures of innovation systems. They are in charge of complementing the work of universities and other research organizations to conduct applied research, as they are strategic partners of companies with lower internal capabilities, such as SMEs (Roessl *et al.*, 2010; Barge-Gil and Modrego-Rico, 2007). According to the specialized literature (Aström *et al.*, 2008; Arnold *et al.*, 1998; Nath and Mrinalini, 2000; Rush *et al.*, 1996), the best practices of the RTOs, which help

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increase their level of knowledge and improve their capability to respond to market, consist of bonds with companies, universities and other innovation agents.

The joint work between the RTOs, universities, other research organizations and industry helps create channels that facilitate the flow of information (Mrinalini and Nath, 2008), supports local industry and enables access to greater resources and participation in R&D projects internationally.

2.4 Services of the RTOs and barriers to the transference of knowledge and technology, especially to the SMEs

The RTOs work primarily with SMEs (Aström *et al.*, 2008; Barge-Gil *et al.*, 2011; Olazaran *et al.*, 2009; Zubiaurre *et al.*, 2004). One of the main functions of the RTOs is to transfer technology and knowledge to the environment and businesses (Leijten, 2007; Mrinalini and Nath, 2008; Martínez-Gómez *et al.*, 2009; Tann *et al.*, 2002).

The process of technology transfer is essential in the dynamics of innovation of the organizations (Albors-Garrigós *et al.*, 2009), in which the RTOs help companies identify sources of knowledge required to meet technological demand (Barge-Gil and Modrego-Rico, 2008) and optimize the interface between R&D/design and manufacture (Albors-Garrigós, Zabaleta and Ganzarain, 2010).

The literature identifies some barriers related to technology transfers between SMEs and RTOs (Modrego-Rico *et al.*, 2005). The SMEs, because of their size, are less likely to absorb the knowledge of their environment and to assume the costs associated with research, to access licenses or venture capital (Barge-Gil *et al.*, 2011). Also, they do not give priority to investments in R&D; therefore, a significant number of these companies do not have contact with the RTOs (Aström *et al.*, 2008; Olazaran *et al.*, 2009; Roessl *et al.*, 2010). Therefore, the RTOs should provide technological solutions according to the needs of the SMEs (Zubiaurre *et al.*, 2004) and help them access sources of funding for their projects (Olazaran *et al.*, 2009). By combining different disciplines, the RTOs have the ability to generate and apply knowledge in SMEs (Mrinalini and Nath, 2008) and help them improve their absorption capacity (Albors-Garrigós, Zabaleta and Ganzarain, 2010; Hervás *et al.*, 2012; Intarakumnerd, 2011).

2.5 RTOs' performance indicators

In order to propose the measures of the results of innovation from the RTOs analyzed in this study, the body of literature related with innovative activity of RTOs object of public support was reviewed.

The studies of Modrego-Rico *et al.* (2005) in Spain and Silva and Ramírez (2006) in Brazil, consider operational, financial, relational and organizational factors and their relation with the results to measure the impact of the RTOs. Other studies (Modrego-Rico *et al.*, 2009; Barge-Gil and Modrego-Rico, 2011) measure the impact of RTOs on the environment in comparison with other innovation participants, such as universities, public RTOs and consultants. Finally, some other studies (Leitner, 2005; Nath and Mrinalini, 2000) suggest indicators to measure intangibles: knowledge transfer and innovation in the RTOs.

From a quantitative point of view, some authors (Albors-Garrigós, Zabaleta and Ganzarain, 2010; Aström *et al.*, 2008; Leitner, 2005; Modrego-Rico *et al.*, 2005; Nath and Mrinalini, 2000) proposed volume sales per employee as an appropriate indicator for establishing the result of the RTOs. Other studies have evaluated the combination of private vs public funding (or self-funding) to measure the cooperation of the RTOs and companies in Spain (Mora-Valentin *et al.*, 2004; Modrego-Rico *et al.*, 2005), as well as public funding as a paradigm of the performance of the RTOs in the Nordic countries (Bienkowska *et al.*, 2010) (Table I).

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| EJMBE 26,2 | Internal impact Measurable by the RTO | External impact Measurable in the RTOs effects on the environment and its clients |
|--|---|---|
| | Benchmarking practices related to knowledge transfer to industry | Technical impact: increased competitiveness, improvements in products, processes, logistics |
| 184 | Intellectual capital, scientific personnel, management and composition of human resources Process indicators: national and international projects and percentage of own research | and patents Economic impact: sales, production costs, productivity, jobs and number of customers Impact on investment in resources: investment in R&D, machinery, software, training in human resources management |
| Table I. RTOs' performance indicators | Indicators of private financing, research or guidance with industry RTOs results indicators: patents, scientific publications, prototypes, spin-offs created, new jobs generated, new clients | Impact of intangible assets: new knowledge and external sources of knowledge Other impacts: satisfaction of RTOs in its client companies |

3. Proposed model and hypotheses

On the basis of fieldwork and the review of the analytical framework discussed in Section 2, the development and proposal of a theoretical model[1] is analyzed below.

The proposed theoretical model[2] is composed of nine variables: the technological environment and market competitiveness (V1), public and private funding (V2), innovation strategy (V3), organizational structure (V4), focus and market orientation of the SMEs (V5), relationship with other innovation agents (V6), barriers that RTOs face in transferring knowledge and technology to the SMEs (V7), the innovative performance output (V8) and turnover per employee (V9). The following table describes the items that make up each of the variables of the proposed theoretical model, as well as the academic body of references which supports them, i.e. the source of their selection. In the methodology section it is explained how these variables were constructed (Table II).

The interaction between these proposed variables represents an appropriate scene in which the RTOs can cope with the turbulence and changes that occur in the environment. Figure 1 shows the simplified model, composed of nine variables studied.

The model proposes a balance between public financing, competitive and private funds (V2), the developing of more proactive strategies (V3) and organic organizational structures (V4), which will allow the RTOs to relate better to other innovation agents (V6), work effectively with SMEs (V5), and help these companies to overcome barriers related to their absorption capacity, the perception of risk by investing in technology, the lack of a culture of innovation and lower economic capacity (V7). With the right combination of these factors, the RTOs can better adapt to changes in their environment (V1), obtaining high outputs of innovation (V8) and economic results (V9) which contribute to their sustainability.

In order to support this relation between variables, three hypotheses are formulated considering the literature review and theoretical construct that supports the proposed model.

Morgan in his seminal publication "Imágenes de la Organización" (Morgan, 1986) proposes the organization as an open system that needs careful management to meet and balance domestic needs and adapt to the circumstances of the environment as proposed by the contingent theory. In this sense it could be concluded that the RTOs, like any organization, are conditioned by their environment. To survive in turbulent and dynamic environments, organizations should develop internal capabilities that allow them to be more

| | Variable | Description values from 1 to 5 | References | competitive |
|----|---|---|---|------------------------------------|
| V1 | Technological environment and market competitiveness. Data provided by the RTOs, and secondary sources (sectoral studies and technological observatories) | Technology uncertainty, market competitiveness, technology life cycle (stable vs turbulent environment) | Arnold <i>et al.</i> (2010), Barge-Gil and Modrego-Rico (2008), Callejón <i>et al.</i> (2007), Deutsch <i>et al.</i> (2009), Leijten (2007), Leitner (2005), Modrego-Rico <i>et al.</i> (2005), Roessl <i>et al.</i> (2010) and | 185 |
| V2 | Public and private financing. Self-financing of the RTO Data provided by the RTOs surveyed and complemented by reports of FEDIT, REDIT, TECNALIA and IK4 | Origin and percentage of funding (public – private, competitive – non-competitive) | Arnold <i>et al.</i> (1996) Arnold <i>et al.</i> (1998), Aström <i>et al.</i> (2008), Barge-Gil and Modrego-Rico (2008), Cho <i>et al.</i> (2011), Leitner (2005), Loikkanen <i>et al.</i> (2011), Preissl (2006), Rush <i>et al.</i> (1996) and Santamaría <i>et al.</i> (2002) | |
| V3 | Innovation strategy of the RTO Data provided by RTOs surveyed | Motivation for the RTOs establishment, R&D activity, risk assumption policies, research freedom, pioneering. (proactive vs reactive) | Arnold <i>et al.</i> (1998), Aström <i>et al.</i> (2008), Intarakumnerd and Chairatana (2008), Intarakumnerd (2011), Leitner (2005), Nath and Mrinalini (2000), Rush <i>et al.</i> (1996) and Santamaria <i>et al.</i> (2002) | |
| V4 | Organizational structure of the RTO Data provided by RTOs surveyed | Hierarchy levels, organization structure, staff stability, working groups, decision making, personnel selection criteria, professional careers, salary policies (mechanical vs organic structures) | Callejón <i>et al.</i> (2007), Intarakumnerd (2011), Mrinalini and Nath (2008), Modrego-Rico <i>et al.</i> (2005), Olazaran <i>et al.</i> (2009), Rush <i>et al.</i> (1996) and Silva and Ramírez (2006) | |
| V5 | Orientation and approach to the knowledge transfer and technology to SMEs Data provided by the RTOs surveyed and information contained in the RTOs activity reports | Percentage of the main firm customers size SMEs – medium companies – large companies | Aström <i>et al.</i> (2008), Barge-Gil and Modrego-Rico (2008), Barge-Gil <i>et al.</i> (2011), Callejón <i>et al.</i> (2007), Hervás <i>et al.</i> (2012), Intarakumnerd and Chairatana (2008), Intarakumnerd (2011), Mas-Verdú <i>et al.</i> (2008), Olazaran <i>et al.</i> (2009), Santamaría <i>et al.</i> (2002), Sharif and Baark (2011) and Zubiaurre <i>et al.</i> (2000) | |
| V6 | Relationship with other agents of the innovation system Data provided by the RTOs surveyed and information contained in the RTOs' activity reports | Level and frequency of collaboration with other innovation agents (Regional, Spain and Europe) | Aström <i>et al.</i> (2008), Arnold <i>et al.</i> (2008), Arnold <i>et al.</i> (2010), Barge-Gil and Modrego-Rico (2007), Berger and Hofer (2011), Callejón <i>et al.</i> (2007), Mrinalini and Nath (2008), Rush <i>et al.</i> (2000) <i>et al.</i> (2001), <i>Callejón et al.</i> | |
| V7 | Barriers that the RTO finds to transfer knowledge or technology to SMEs Data provided by RTOs surveyed | The main barriers that RTOs encounter to work with SMEs: financial, innovative culture and SMEs technology absorptive capacity | Albors-Garrigós, Zabaleta and Ganzarain (2010), Aström <i>et al.</i> (2008), Barge-Gil and Modrego- Rico (2011), Barge-Gil <i>et al.</i> (2011), Callejón <i>et al.</i> (2007), Hervás <i>et al.</i> (2012), Intarakumnerd, (2011), Martínez-Gómez <i>et al.</i> (2009), | Table II |
| | | | (continued) | Variables of the theoretical model |

| EJMBE | Variable | Description values from 1 to 5 | References |
|-----------|--|---|---|
| 186 | V8 Innovative performance (output) from the RTO's internal point of view Data provided by the RTOs surveyed and information contained in the RTOs activity reports | Obtained results by RTOs (patents, spin-offs, scientific publications, new generated jobs and new clients) | Mas-Verdú et al. (2008), Mrinalini and Nath (2008), Modrego-Rico et al. (2005), Nath and Mrinalini (2000), Olazaran et al. (2009), Roessl et al. (2010), Silva and Ramírez (2006), Tann et al. (2002) and Zubiaurre et al. (2004) Albors-Garrigós, Segarra and Rincón-Diaz, (2010), Arnold et al. (1998), Aström et al. (2008), Barge-Gil and Modrego-Rico (2008), Callejón et al. (2007), Leitner (2005), Modrego-Rico et al. (2005, 2009), and Silva and Ramírez (2006) |
| Table II. | V9 Turnover per employee Data provided by RTOs surveyed | Turnover per employee without public support standardized values | Albors-Garrigós, Segarra and Rincón-Diaz (2010), Arnold <i>et al.</i> (2010), Aström <i>et al.</i> (2008), Leitner (2005) and Nath and Mrinalini (2000) |



Figure 1. Proposed model for studying research technology organizations

flexible, proactive and interact better with their environment (Deutsch *et al.*, 2009; Silverblatt and Korgaonkar, 1987; Tidd, 2001). This leads us to formulate the first hypothesis:

H1. Following the focus of the contingent theory, the ability of the RTOs to respond or adapt to changes in their environment is determined by the innovation strategy, the type of organizational structure of the RTOs, their focus on knowledge transfer to the SMEs and the level of relation which they have with other agents of innovation. Thus, according to the environment in which they operate, the RTOs are dynamic (turbulent) or static, have an innovation strategy that is reactive or proactive, an organizational structure that is mechanical or organic, a level of interaction with other agents of innovation that is more or less active and a development that is more or less innovative.

RTOs with a higher degree of self-finance can develop better projects with SMEs (Mora-Valentin *et al.*, 2004; Bienkowska *et al.*, 2010). There are limitations to access funding sources from SMEs (Modrego-Rico *et al.*, 2005; Olazaran *et al.*, 2009; Aström *et al.*, 2008) making it difficult to implement R&D projects (Callejón *et al.*, 2007), difficulties absorbing knowledge (Molina-Morales and Mas-Verdú, 2008; Barge-Gil *et al.*, 2011) and uncertainty associated with the high costs of innovative process that represent insurmountable barriers (Silva and Ramírez, 2006).

Culturally the R + D + i is not among the priorities of the SMEs (Aström *et al.*, 2008; Olazaran *et al.*, 2009; Roessl *et al.*, 2010). The companies that collaborate with the RTOs get good technological results, but do not always translate them into the expected economic results, partly because they do not fully adapt to customers' needs (Zubiaurre *et al.*, 2004), or because of the difficulty of RTOs to communicate with their customers. (Olazaran *et al.*, 2009).

In conclusion, the success of the results in transfer of technology and knowledge of RTOs depends largely on the development of internal capabilities by the SMEs (Zubiaurre *et al.*, 2004; Barge-Gil and Modrego-Rico, 2011). In this context the following hypothesis is proposed:

H2. The source of financing, that is the percentage of private funding or the noncompetitive public funding (self-funding), and the barriers that RTOs face to transfer knowledge and technology to the SMEs, influence their innovative performance. To increase self-funding and lower barriers, the performance has to be higher.

Some authors argue that there is a positive relation between the turnover of the RTOs and the results in innovation (Aström *et al.*, 2008), others emphasize the difficulty of reconciling both because of the lack of freedom of research associated with this type of contracts (Arnold *et al.*, 1998; Nath and Mrinalini, 2000), and a third current (Albors-Garrigós, Zabaleta and Ganzarain, 2010; Arnold *et al.*, 2010; Aström *et al.*, 2008; Leitner, 2005; Nath and Mrinalini, 2000) proposes the volume of sales per employee as an indicator of appropriate result to establish the impact of the RTOs in their sector.

In short, there is no consensus in the academic literature to establish a positive relation between sales figures with the outputs of innovation and intensity in R&D, as an indicator of performance of the RTOs. The proposed hypothesis based on this reason is as follows:

H3. The results of innovation of the RTOs are positively related to their financial performance indicators.

4. Methodological design

The fieldwork was based on a questionnaire of 50 questions covering eight areas of operation of the RTOs: organizational, environment and strategy, operational, relational and customers, finance and results areas. Initially 15 variables were identified, but only those nine variables that produce statistically significant results were selected; this means a statistically acceptable reliability. Given the limited space, the process cannot be described in detail, but is conveniently described in Rincón-Díaz (2014). Table III shows an example of valuation of the nine variables of one of the RTOs studied.

From the information on the eight areas of operation of the RTOs, the necessary information was collected to complete and sustain the nine variables that make up the Competitive strategies

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proposed theoretical model. The responses were generated on a Likert scale (1-5). In order to simplify the statistical analysis, each of the study variables was built from expressed standardized values; also, in a Likert scale of five points, using the same criteria for all the RTOs ensured that the final measures were comparable.

The questionnaire was completed through personal interviews conducted with the directors of 14 RTOs of the Valencian Community and 13 RTOs of the Basque Country. Each interview was conducted for about two hours in order to obtain reliable results; the interviewers ensured that questions were understood and completed in full. Also, secondary sources of information on the activities of the RTOs, such as annual reports, special reports and websites, were also consulted.

Subsequently, using the obtained standardized values, a correlation analysis to statistically test the hypotheses raised research was conducted.

The next step was to conduct a factorial analysis. According to Hair *et al.* (2007), the minimum sample size must be at least 50 to perform a factorial analysis, with a factorial load of 0.75. The size of the sample used in this research is 27 RTOs. However, it was considered appropriate to perform a factorial analysis with less data, considering that the sample corresponds to 81.8 percent of the population of the RTOs of the two communities studied. Finally, a hierarchical cluster analysis was carried out in order to analyze whether there are groups of RTOs according to the factors obtained. All of this was done in order to see how the RTOs of the two autonomous communities are grouped according to their ability to adapt to the dynamism of their environment.

5. Results

After standardizing each of the study variables to a five-point Likert scale for the 27 RTOs, these values were taken and a correlation analysis was carried out between the variables to test the research hypotheses. Applying the coefficient of Tau-b of Kendall for non-parametric data (-1+1), Table IV shows the bilateral correlation to an acceptable level of significance (*) 0.05.

There is a positive correlation between technological environment (V1) with the innovation strategy (V3), the organizational structure (V4), the level of relation with other innovation agents (V6) and the innovative performance (V8). A positive relation is observed between innovation strategy (V3), with the organizational structure (V4), the level of relation with other innovation agents (V6) and innovative performance (V8). Another positive correlation found corresponds to the organizational structure (V4), with the level of relation with other innovation agents (V6), and the positive correlation between the level of relation with other innovation agents (V6), and the positive correlation between the level of relation with other innovation agents (V6) and the innovative performance (V8). The results obtained show that the correlation coefficients of the funding of the RTOs (V2) and guidance to the SMEs (V5) with other variables show negative signs, or an important number of values that were difficult to contrast and difficult to reach definitive conclusions.

Finally, it can be observed that there is no significant correlation between the barriers that the RTOs face when transferring knowledge and technology to the SMEs (V7), and the innovative performance (V8). Also, there is no correlation between turnover per employee (V9) and other study variables.

| Table III. | RTO | V1 | V2 | V3 | V4 | V5 | V6 | V7 | V8 | V9 |
|-------------------------------|----------|------------|-------------|--------------|-------------|--------|------|------|------|------|
| Variables of RTOs assessed | 5 | 4.15 | 4.53 | 3.75 | 3.85 | 3.20 | 4.65 | 3.75 | 4.75 | 2.80 |
| on Likert scale | Note: Ex | ample of f | inal values | given to the | e study var | iables | | | | |

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| <u>V7 V8 V9</u> Strategies | V7 V8 | V6 | V5 | V4 | V3 | V2 | V1 | Kendall's tau-b |
|---|------------------------|--------------|---------------|-------------|-------------|-----------|------|------------------------|
| 0.074 0.576** 0.173 | 0.074 0.57 | 0.459** | -0.408** | 0.483** | 0.662** | -0.326* | 1 | V1 |
| 0.609 0.000 0.210 | 0.609 0.00 | 0.001 | 0.003 | 0.000 | 0.000 | 0.018 | | Bilateral significance |
| -0.266 -0.430** -0.011 | -0.266 -0.43 | -0.069 | 0.087 | -0.193 | -0.244 | 1 | | V2 |
| 0.067 0.002 0.933 | 0.067 0.002 | 0.617 | 0.530 | 0.162 | 0.076 | | | Bilateral significance |
| 0.170 0.456** 0.152 | 0.170 0.45 | 0.574** | -0.362** | 0.576** | 1 | | | V3 |
| 0.242 0.001 0.269 189 | 0.242 0.00 | 0.000 | 0.009 | 0.000 | | | | Bilateral significance |
| -0.062 0.268 0.144 | -0.062 0.26 | 0.551** | -0.344* | 1 | | | | V4 |
| 0.670 0.052 0.296 | 0.670 0.05 | 0.000 | 0.014 | | | | | Bilateral significance |
| 0.078 -0.130 0.003 | 0.078 -0.13 | -0.211 | 1 | | | | | V5 |
| 0.594 0.347 0.983 | 0.594 0.34 | 0.127 | | | | | | Bilateral significance |
| 0.083 0.357** 0.237 | 0.083 0.35 | 1 | | | | | | V6 |
| 0.566 0.009 0.083 | 0.566 0.009 | | | | | | | Bilateral significance |
| $1 0.296^* -0.071$ | 1 0.29 | | | | | | | V7 |
| 0.041 0.625 | 0.04 | | | | | | | Bilateral significance |
| 1 0.095 | 1 | | | | | | | V8 |
| 0.491 | | | | | | | | Bilateral significance |
| 1 | | | | | | | | V9 |
| Table W | | | | | | | | Bilateral significance |
| ant at $*p < 0.05$; $**p < 0.01$ Correlation between | t at * <i>p</i> < 0.05 | n significar |). Correlatio | lata (-1+1) | arametric c | for non-p | ient | Notes: Tau-b coeffic |

Under a contingent approach, these results show the RTOs which are in more turbulent environments (V1) with a high technological rotation, which follow innovation strategies (V3) more proactively and show more organic organizational structures (V3), more organic in comparison to the ones from the RTOs, which work with mature sectors and low innovative industries, and are of low technology level, which assume more reactive strategies. Differences between the type of client company (V5) and the relation with other innovative agents (V6) in both communities are also observed. The Valencian RTOs work with companies of a medium and low technological level and interact less with other agents of innovation and regional and national RTOs, whereas the Basque RTOs focus on larger companies and with a higher technological level and, in turn, it keeps them closer to universities and other agents of European innovation.

The origin and percentage of the RTOs' financing (V2) was estimated from secondary information. With these data it is possible to observe the negative correlation with innovative performance (output) (V8) in both communities. The Valencian RTOs have a higher percentage of non-competitive public funding, while in the Basque RTOs the percentage of competitive private and public funding is greater. With regard to the barriers that the RTOs have to transfer knowledge and technology to the SMEs (V7), they are important for all the RTO respondents. The Valencian RTOs give more importance to financial barriers and innovative culture of the SMEs, but consider absorption capacity of the enterprises to be less relevant. The Basque RTOs express that the financial barriers and the risk perception of businesses represent major obstacles.

The Basque RTOs have higher innovation outputs (V8) than the Valencian RTOs, in the number of patents, creation of spin-off enterprises, scientific publications and generation of new job positions. With some exceptions, some Basque RTOs, which work in more turbulent environments, have a lower ratio of outputs as they have comparatively lower values in scientific publications, new job positions and new clients. The results of innovative performance of the Valencian RTOs reveal a percentage of new customers tripling that of the Basque RTOs in the last year. This difference substantially increases the final result of this variable.

Subsequently, a factorial analysis, in order to establish whether there was grouping between variables, was performed. Initially, the measure of sampling adequacy KMO ≥ 0.5 was obtained, whose result of 0.567 is considered acceptable. In this analysis, the significance is equal to (Sig) = 0.000; therefore, it is possible to ensure that the factorial model is adequate to explain the data. When calculating the matrix of commonalities, it was observed that the variables that less explain the model are the funding (V2), which is only able to produce 56.8 percent of the variability, and the barriers that the RTOs face when transferring knowledge and technology to the SMEs (V7), which reproduces only 59.8 percent of their original variability.

Using the method of extraction of main components, three factors that explain the 75.33 percent of the total variance were obtained. To better interpret the factors obtained, a rotation was carried out using the Varimax method with Kaiser. The results obtained are shown in Table V.

The first factor is composed of the following variables: (V1) technological environment; (V3) innovation strategy; (V4) organizational structure; (V5) orientation to the SMEs; and (V6) relation with other agents of innovation. This first factor will be called "strategy" and it is related to the first research hypothesis. The second factor is composed of the following variables: (V2) financing; (V7) RTOs barriers to transfer knowledge and technology to SMEs; and (V8) innovative performance (output). This factor will be called "performance," which in turn is related to the second research hypothesis.

Finally, the third factor is composed only of the variable "Facturación" turnover per employee (V9). This factor will be called "output of result." Although, this variable it is not correlated with the innovative performance, it represents an appropriate indicator to measure the performance of an organization.

Subsequently, a hierarchical cluster analysis was performed to establish whether there are groups of RTOs according to the factors obtained. Three clusters were obtained, each one consisting of different RTOs of both autonomous regions, as shown in Table VI.

This cluster analysis helps the interpretation of the proposed model and helps to establish how the RTOs adapt or respond to cope with the turbulence of their environment. To do this, it requires the contingency between key variables of the RTOs, such as the strategy (V3), the organizational structure (V4), their relation with companies (V5),

| | | Component | | | | |
|---|---|---------------------|-------------------------|--------------------------|--|--|
| | | 1 | 2 | 3 | | |
| | V1 technological environment | 0.803 | 0.396 | 0.166 | | |
| | V2 funding | -0.171 | -0.733 | 0.049 | | |
| | V3 innovation strategy | 0.883 | 0.330 | 0.096 | | |
| | V4 organizational structure | 0.894 | 0.003 | 0.053 | | |
| | V5 orientation to SMEs market | -0.679 | 0.287 | 0.510 | | |
| | V6 relationship with other innovation agents | 0.748 | 0.144 | 0.376 | | |
| | V7 RTO's barriers | -0.074 | 0.765 | -0.089 | | |
| | V8 innovative performance (output) | 0.391 | 0.767 | 0.165 | | |
| Table V. | V9 turnover per employee | 0.226 | -0.131 | 0.850 | | |
| Matrix of rotated components ^a | Notes: Extraction: main component analysis. Rota rotation has turned into four iterations | ation method: Varim | ax standardization with | Kaiser. ^a The | | |
| | | 14 15 16 17 10 | 10 00 01 00 02 04 | | | |
| Table VI | RIUS 1 2 3 4 5 6 7 8 9 10 11 12 13 | 14 15 16 17 18 | 0 19 20 21 22 23 24 | : 25 26 27 | | |
| Cluster of belonging | Cluster 1 1 1 1 2 1 1 1 3 2 1 2 2 | 2 1 2 3 3 | 1 3 2 3 3 2 | $3 \ 2 \ 3$ | | |

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the relation with other innovation agents (V6), and their innovative performance (V8), with the technological environment (V1) in which they operate. The Figure 2 shows different scenarios according to the turbulence of the environment and the capacity required from the RTOs to adapt or respond to such turbulence.

Figure 2 shows on its vertical axis the different types of technological environment (V1). This environment responds to a number of political, technological and market factors, over which the RTOs have no control in general. In the proposed model, there are three types of environment for RTOs: a highly turbulent technological environment (C), characterized by a high uncertainty, a moderately turbulent (B) technological environment, of a less uncertainty, and a more stable technological environment (A), or a little turbulent and of a low uncertainty.

On the horizontal axis of the figure, there are three levels of adaptation or response from the RTOs to the turbulence of the technological environment (1, 2, 3). Such adaptability or response capacity consists of the variables that best represent the proposed model (V3, V4, V5, V6, V8). Unlike hardly changed environment, it is possible for the RTOs to improve outcomes in these variables. The higher the value of these variables in RTOs, the greater their ability to adapt or response to the RTOs in more dynamic and turbulent environments. Following the idea presented in Figure 2, it is shown below how the RTOs are distributed in both regions according to the three clusters obtained (Figure 3).

As can be seen in Table VI the RTOs from 1 to 14 belongs to the Valencian Community and the RTOs from 15 to 27 belongs to the Basque Country. In Figure 3 it is shown that the three clusters are contingent with the proposed variables in the model: on the vertical axis is the variable V1 and the on the horizontal axis the variables V3, V4, V5, V6 and V8, which constitute the adaptability or RTOs' response capacity to the turbulence of the environment of the RTOs.



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According to the classification of the RTOs carried out in Table VI, the RTOs of the first cluster (1 - A) are in some turbulent environments and belong to traditional and mature sectors. This cluster is made up of eight RTOs of the Valencian Community and two RTOs of the Basque Country. These RTOs possess strategies of reactive innovation and organizational structure which is more mechanical. There are RTOs which generally focus their work on the SMEs, but have a low level of relation with other agents of innovation and universities. Their results of innovation are low, with the exception of the RTOs 6, 7 and 8 whose outputs of innovation are higher.

The RTOs of the second cluster (2 - B) go through a transition process that allows them to enter new sectors and innovative environments through the development of more horizontal technologies. This cluster consists of five RTOs of Valencian Community and four RTOs of the Basque Country, which have comparatively higher values in their type of innovation strategy, organizational structure, approach to SMEs, ability to relate better to other innovation agents and innovation outputs, than the RTOs of the first cluster.

The third cluster (3 - C) is made up by the highly innovative and intensive R&D RTOs working in highly turbulent environments. This cluster is composed of seven RTOs of the Basque Country and one RTO of the Valencian Community. The Basque RTOs, of this conglomerate, work in highly dynamic environments and with less mature and innovative sectors. They possess highly proactive innovation and organizational strategies that are more organic. These RTOs relate better to other innovation agents and a major percentage of their main customers are big companies. Their innovation outputs are high, although highly comparative to the Valencian RTOs, and they present lower values in the number of new client companies.

6. Conclusions

The objectives of this study were to examine the strategies employed by the RTOs of the Valencian Community and the Basque Country to adapt to their environments, identify barriers encountered and best practices carried out that suit them and be more competitive. The research examined the relation between the variables that make up the proposed theoretical model to study RTOs. The analysis shows that context variables, such as the technological environment and the competitiveness of the market, the type of funding, their innovation strategy, the level of relation with other agents of innovation and barriers found to transfer knowledge and technology to the SMEs, affect the efficiency of the RTOs, measured by their innovative performance. Following the considered hypotheses, the conclusions that can be drawn from the analyzed data are summarized below.

This paper proposes a holistic and dynamic vision which provides a global overview of the RTOs considering all the strategic aspects and the industrial policy issues that so far have been managed in a fragmented way in those investigations, and the historical review of the concerned literature to the RTOs which has not been published until now. It can be seen in some articles, as a vision of the impact of globalization on the RTOs (Berger and Hofer, 2011; Sharif and Baark, 2011).

Around the first hypothesis, the proposed model, supported empirically, shows a contingent relation between the technological environment, the innovation strategy and the organizational structure, in accordance with the proposals by Burns and Stalker (1961), Gordon *et al.* (2000), Khandwalla (1972) and Terreberry (1968). The RTOs should seek congruence between these key variables to achieve optimal performance, become more competitive and better adapt to the changes in their environment.

The Basque Country is characterized by a more dynamic and innovative industrial environment. With the exception of the RTOs 15 and 19, working with sectors of low technology, this community has a greater number of RTOs that present more organic organizational structures and follow more proactive innovation strategies that allow them to adapt better to highly turbulent environments, such as the RTOs 17, 18, 20, 23, 25 and 27, or to moderately turbulent environments, such as the RTOs 16, 21, 24 and 26. In the Valencian Community, there are more RTOs working in traditional sectors with industries of low technology level, the RTOs 1, 2, 3, 4, 6, 7, 8 and 11. These RTOs, when faced with the difficulty of environment dynamism, show more mechanical organizational structures, follow reactive innovation strategies oriented to the subsistence, follow little diversification and have high competition with similar RTOs. In this community, only the RTOs 5, 9, 10, 12, 13 and 14, which are in moderately turbulent environments, have average levels of organic structure and follow more proactive innovation strategies.

The first hypothesis also includes the contingent relation between technological environment of the RTOs, with their focus on the SMEs and the ability to relate to other innovation agents. There are differences between the two communities in the focus of the RTOs towards the SMEs. The most innovative RTOs according to the data obtained are more related to large and medium enterprises; it is important to remember that RTOs were created to meet the needs of the SMEs. Also, differences were identified in the ability of the RTOs to interact with other innovation agents; some RTOs that are found in mature sectors and are a little innovative have a good relation with universities and other agents in the innovation system. For these reasons, it is concluded that the first hypothesis can be partially validated. Emphasis should be placed on how important it is for the RTOs to interact through interactive networks, which is a best practice described by authors such as Aström *et al.* (2008), Arnold *et al.* (1998), Nath and Mrinalini (2000) and Rush *et al.* (1996).

Regarding the second hypothesis, considering the differences between the funding models used by the RTOs in both communities, the estimated data shows a negative correlation between the funding and the innovative performance (output). The Valencian RTOs have a higher percentage of non-competitive public funding and are less involved in competitive projects, whereas the Basque RTOs have greater self-funding capacity and obtain greater resources of competitive projects and private funding. Although there is a correlation between these two variables, the result must be interpreted with caution, as the data of the funding of RTOs were obtained mostly from secondary sources. With respect to the barriers that the RTOs face to transfer knowledge and technology to the SMEs (V7), although they are related to their innovative performance (V8), it is not possible to establish which influence is present in greater or in lesser degree in the performance of the RTOs; that is the reason it is concluded that the second hypothesis is not met. The personal interviews have shown significant differences between the environments of both communities. In this sense, the tradition of the Basque industries has facilitated the templates of the companies

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and their leaders to have a higher level of human capital (Pérez and Serrano, 2013), redound it in a bigger absorption capacity and recognition of the need for R + D + i.

The economic results expressed in the ratio of turnover per employee (V9) and the innovative performance (output) (V8) of the RTOs are not correlated. Despite being a good indicator of performance, the difference in values between the RTOs with higher outputs of innovation does not allow to infer any conclusion. It is therefore concluded that the third hypothesis cannot be validated. It underlines the fact that the data about the origins of the RTOs' funding are unclear or standardized. It was observed in the fieldwork that the causes are basically the accounting divergence in the production of the RTOs balance sheets, the absence of a reliable database about funding thereof, the diversity of local, domestic and European origins, or the lack of a standardization of the concepts about the competitive, non-competitive funding, etc.

The analysis of the variables helps us to identify some of the best practices developed by the RTOs. The Valencian RTOs perform activities to meet the market and needs of their client companies, which make up mixed teams of workers from both the RTOs and companies during the development of projects and carry out activities to disseminate developed knowledge and technology. However, the level of formalization of their R+D projects is generally low, which results in a lower efficiency. For the Basque RTOs some of the best practices are made up of the knowledge of the innovation strategy of the client companies, defined by monitoring mechanisms for projects, done by planned marketing activities and visits to meet the needs of companies. Leadership and remuneration for goals are generally lacking. For all the RTO respondents, these practices have a high impact on the competitiveness of enterprises.

According to the theoretical construct, it can be concluded that under the approach of the contingent theory, the organizations can cope with the turbulence of the environment through a contingent relation between their organizational structure and their strategy. In both regions, the RTOs with more proactive strategies and more organic structures are able to better face the turbulence of the environment and to assume new challenges, as they have a more open strategy to the collaboration with other innovation agents and a higher technological level allowing them to achieve a better innovation performance. The RTOs with a more mechanical organizational structure have more trouble coping with changes in their environment, basically being conditioned to the characteristics of low technology which they work with. To be able to survive, these RTOs have to find formulas that allow them to enter new sectors through the integration of different technologies and networking with other RTOs. In short, especially applicable to those whose environment has changed substantially (traditional sectors), RTOs must adopt more organic and proactive organizational schemes, because the paradigms of these sectors (furniture, mechanical metal, ceramic, textile, footwear) have changed substantially and require strategies more oriented to adding value.

At being integrated into two technology platforms, the Basque RTOs have better conditions to reach a critical mass, internationalize and be more competitive. Only some of their RTOs present major obstacles to face the turbulence of their environment, mainly because they belong to mature sectors with low innovation. Meanwhile, the Valencian RTOs must strengthen themselves and redirect their strategy to relate better with universities, reach critical mass and generate synergies to reduce duplication in research, considering that some RTOs investigate in the same areas, for example TICs, ergonomics and electronics. Their high dependence on public funding makes them vulnerable, but does not imply that there is a lack of capacity to adapt and survive. The recent policies of reduction in these RTOs have caused a significant loss of human capital, as well as some demoralization of their workforces. On the other hand, this situation has caused a greater lack of coordination between them in contrast to what happens to the RTOs of the Basque Country[3]. The search for new forms of funding and the internationalization process, written down by some authors (Aström *et al.*, 2008; Berger and Hofer, 2011; Martínez-Gómez *et al.*, 2009), are always necessary as long as they do not move away the RTOs from their purpose of being non-profit organizations, supporting the innovative activity of companies with lower capacities. For this reason, to meet new challenges, be more competitive and respond efficiently to the changes in the environment, the RTOs need a technology policy more in line with the specific characteristics of each region. This is most evident in the RTOs of the Valencian Community, whose survival is in question. Currently two of the RTOs of the Valencian Community who participated in this study have unfortunately disappeared for not being self-sustaining.

As a contribution to the academic literature on this subject, the proposed theoretical model presents a suitable stage for the RTOs to respond to the changes in the environment and the current globalization of the economy and to cope with the new challenges. This proposal consists of the RTOs maintaining an appropriate combination of key factors, including the development of more proactive innovation strategies, a shift toward organizational structures that are more oriented to disruptive innovations which allow them to relate better with other innovation agents and universities, and which help them to work more efficiently with SMEs and obtain a higher innovative performance and a greater orientation toward innovative change.

Limitations of this paper are primarily related to the sample of the RTOs used. Therefore, the results of this research must be interpreted with caution. Although this study compares two autonomous communities with their own models of RTOs, the results are not generalized to all the Spanish RTOs; the research should be expanded and contrasted with RTOs of other autonomous communities.

Notes

- 1. This model is composed of nine variables that were identified by their relevance in the analytical framework.
- 2. The following section explains why nine variables were chosen for this paper.
- 3. www.europapress.es/comunitat-valenciana/ downloaded March 15, 2007.

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Attraction factors of shopping centers

Effects of design and eco-natural environment on intention to visit

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Abstract

Purpose – People visit malls not only to buy a product they need but also to enjoy the atmosphere or environment of the shopping center. Based on design and eco-natural environment, the purpose of this paper is to analyze the attraction factors of shopping centers.

Design/methodology/approach – The sample comprised 449 consumers from 25 different shopping centers in Bogota. The structural equation model (AMOS) enables the authors to discuss the influence of the design of green and natural spaces in the commercial management of shopping centers, given its positive and significant effect on the intention to visit.

Findings – Shopping centers are, by definition, spaces with a high level of design of the commercial environment. In this case, as evidenced in the results of this research, the design of ecological spaces and environments has the potential of becoming a field of interest for the commercial management of shopping centers, given its potential effect on visiting and shopping intentions.

Originality/value – The main originality of this study was to empirically include and demonstrate the influence of design and natural eco-environment on the intention to visit, along with other elements considered in previous investigations. Therefore, identification of specific empirical findings related to the way attraction factors work allows marketing directors and managers to improve their management decisions concerning design and implementation of marketing strategies, tactical decision guidance, decision-making assessment or control, and the proposal of alternative positioning attributes, such as the design, management, and arrangement of eco-natural environments that allow to increase the number of visits and purchases within these establishments.

Keywords Structural equation modelling, Attraction factors, Shopping centre,

Design and eco-natural environment, Intention to visit

Paper type Research paper

Introduction

Shopping centers have significantly advanced in the application of joint management methods (Howard, 1992, 1997; De Juan and Rivera, 1999). However, several authors such as McGoldrick and Thompson (1992), Finn and Louviere (1996), Dennis *et al.* (2002), and Chebat *et al.* (2010) considered that in addition to the integrated management, shopping centers should improve the offer conditions, their attractiveness, and their image by

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Attraction factors of shopping centers

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European Journal of Management and Business Economics Vol. 26 No. 2, 2017 pp. 199-219 Emerald Publishing Limited 2444-8451 DOI 10.1108/EJMBE-07-2017-012 considering other alternative or complementary factors. Different studies have supported the interest of investigating the establishments that have introduced and developed a type of management facilitating the exploitation of the trade market. Some studies have focused on increasing their attractiveness and the fidelity of their client through their image (Ortegon and Royo, 2015; Chebat *et al.*, 2010; Vigaray and Camino, 1999), becoming a space for meetings, entertainment, leisure, relaxation, and interchange (Porral and Dopico, 2013). Other studies have focused on providing memorable experiences of diverse sensorial,
emotional, and behavioral (Ortegon and Gomez, 2017; Kim *et al.*, 2015; Kim, 2001). Such issues described in further detail by Srinivasan and Srivastava (2010) and Tandon *et al.* (2016) are not developed here for the purpose of this study.

The literature on the attraction factors of shopping centers has focused on the possibility of model creation to determine the demand for attraction and the intention to visit (El-Adly and Eid, 2016; McGoldrick and Thompson, 1992; Finn and Louviere, 1996; Chebat *et al.*, 2010). These approaches have contributed to the development of new integrated management models based on the permanent assessment of consumers on the primary attributes and factors that comprise this attraction (Finn and Louviere, 1996; Alemán and Díaz, 2006; Driesener and Romaniuk, 2006).

Based on the foregoing arguments, this study measures the attraction factors integrating a factor denominated herein as design perception and the eco-natural environment. Therefore, the originality of this study lies in two aspects:

- (1) the design and eco-natural environment proposal as an attraction factor of shopping centers; and
- (2) the consideration of statistical relations between the attraction factors (including the design and the eco-natural environment) and the intention to visit as a dependent variable in a complete structural equation model.

This effect has proved to be of particular importance for commercial management and the attainment of competitive advantage when applied to other fields such as hotels and big stores (Brengman *et al.*, 2012; Rogerson and Sims, 2012; Lee *et al.*, 2010; Kim and Han, 2010).

This study is structured as follows. First, the conceptual framework of these variables and its relations are presented, with the objective of supporting the suggested hypothesis. Thereafter, the used methodology and the results obtained from the structural equation model are described. Finally, the business implication and the future lines of investigation are exposed.

Theoretical review

Several dimensional typologies can be used to create a model of attraction factors of a shopping center (North and Kotze, 2004). Among these factors, the offer, accessibility, service, and environment variables are always present.

Attraction factors of the shopping centers

According to Munuera and Cuestas (2006), most international studies have focused on commercial establishments and their individual features; however, these studies have not considered the shopping center as a unit of analysis. Micu (2013) found that various attraction factors of the shopping center are mainly oriented toward the geographical and cultural features of the study. Accordingly, a plurality of attraction factors in the reviewed literature is observed (see Table I).

Ultimately, there is no consensus regarding numerous attraction factors because the variables that constitute them are multiple and may refer to tangible and intangible aspects, which also depend on the subjective assessment of each (North and Kotze, 2004).

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| Study | Number of factors | Factors | Attraction factors of |
|-----------------------------|----------------------|--|--------------------------|
| Singh and Prashar (2013) | 5 | Environment, access, physical environment, offer management, and security | shopping centers |
| Banerjee (2012) | 9 | Establishment image, entertainment, access and convenience, physical environment, security, visitors' lifestyle, time-saving, architecture, and commercial rewards | 201 |
| Sujo and Bharati (2012) | 5 | Attractiveness, environment comfort, service staff, shopping easiness, and convenience | |
| Hira and Mehvish (2012) | 3 | Inner environment, establishment image, and access easiness | |
| Rajagopal (2009) | 7 | The shopping center offer, excitement level, promotions, purchase volume, distance traveled inside the establishment, time employed in the establishment and preference for traditional stores | |
| Teller and Reutterer (2008) | 4 | Access, location, visitors, and environment perception | |
| Ahmad (2012) | 6 | Environment aesthetics, access, and comfort, offer variety, entertainment, and service quality | |
| El-Adly (2007) | 6 | Comfort, entertainment, offer variety, shopping center features (range, services, and prices), convenience and access, and luxury perception | |
| Khei et al. (2001) | 5 | Access easiness, offer quality and variety, offer popularity and luxury, shopping center facilities and environment, and the presence of diverse commercial incentives | |
| Ruiz (1999) | 3 | Commercial environment and variety, parking and shopping scene, and staff professionalism | |
| Bodkin and Lord (1997) | 4 | Convenience, existence of a particular store in the shopping center, services provided, and prices | Table I. |
| Source: Own development | t | • · · · · · · · · · · · · · · · · · · · | shopping centers |

However, the attraction factor analysis of shopping centers and establishments is conceived as a strategy of competitive distribution to draw more clients to the shopping facilities and improve their experience (Bigné and Andreu, 2004). From this perspective, assessing the attractiveness of the shopping centers is important for the following reasons: to improve its own management due to its relation with the intention to visit (Michon *et al.*, 2005), and to provide information about the relation between attraction factors and consumer profiles, i.e., to give knowledge on the segmentation and specialization of shopping centers based on the understanding of the style of clients' purchasing decisions (Alavi *et al.*, 2016).

Identification of attraction factors and establishment of the hypothesis

Based on the reviewed literature, six attraction factors are prominent: five traditional dimensions and the sixth one regarding the design and eco-natural environment perceived by visitors. A brief description of each variable with its particular hypothesis is presented, with specific focus on the design and eco-natural environment variable.

Physical environment, cleanliness, and security. Several authors described the importance of physical environment for the visitors behavior within shopping centers (Mehrabian and Russell, 1974; Wakefield and Baker, 1998; Turley and Milliman, 2000; Khei *et al.*, 2001; Bigne *et al.*, 2006; El-Adly, 2007; Ahmad, 2012; Hira and Mehvish, 2012; Sujo and Bharati, 2012; Singh and Prashar, 2013). In sum, physical environment, cleanliness (Ahmad, 2012; Dennis *et al.*, 2002), and security (Hoffman and Turley, 2002) are important factors influencing visitor behavior in shopping centers. Consequently, considering the importance of this feature, the following hypothesis is proposed:

H1. Physical environment, cleanliness, and security positively impact the users' intention to visit the shopping center.

According to the previous consideration, the effects of physical environment can transcend when oriented toward design and the use of green or natural spaces as shown in recent studies.

Design and eco-natural environment. The design and eco-natural environment perception of the shopping center is of particular concern in the literature related to environmental and atmospheric features of shopping settings. Do Paço and Raposo (2009) highlighted the importance and influence of the use of ecological elements in commercial settings on the attitudes and intention to visit and buy. In the tourism field, some empirical results exist on the effects of ecological design used in hotels for the attainment of competitive advantage (Lee *et al.*, 2010) and the client's preference for hotels with ecological resources (Rogerson and Sims, 2012; Kim and Han, 2010; Weinmaster, 2009; Ayala, 1995).

In the commercial field, Brengman *et al.* (2012) proved that the incorporation of spaces with vegetation impacts shopping behavior and emotions. Furthermore, the environmental design of commercial settings oriented toward the consumption and lifestyle in natural spaces favors the relation between the environment and their well-being (Amérigo *et al.*, 2013; Herzog and Strevey, 2008). According to Bigne *et al.* (2006), the creation of an enjoyable environment becomes the objective in the distribution to improve the consumers' shopping experience. Additionally, Amérigo *et al.* (2013) highlighted the increasing interest in researching this area regarding the proenvironmental conduct and the analysis of the individual's attitudes toward the environment (Amérigo *et al.*, 2007; Chebat and Michon, 2003). Therefore, the following hypothesis is proposed:

H2. Design and eco-natural environment perception of the shopping center positively impacts the users' intention to visit the shopping center.

Mobility and accessibility. Some authors considered mobility and accessibility of the shopping center to be more important than attractiveness (Khei *et al.*, 2001; De Juan, 2004; El-Adly, 2007; Teller and Reutterer, 2008; Rajagopal, 2009; Ahmad, 2012; Banerjee, 2012; Hira and Mehvish, 2012). Thus, people look for comfortable, cozy, and convenient commercial establishments or shopping centers. Therefore, the following hypothesis is proposed:

H3. Mobility and accessibility of the shopping center positively impact the users' intention to visit the shopping center.

Additionally, mobility and accessibility features as attraction factors can be favored by different services offered in the field of amusement and entertainment. These features comprise the following variable.

Additional services and entertainment. Studies have indicated that shopping centers have improved their own image and attractiveness due to the inclusion of other services such as food, relaxation, and entertainment services (Bellenger *et al.*, 1977; Haynes and Talpade, 1996; De Nisco and Rosaria Napolitano, 2006; El-Adly, 2007; Ahmad, 2012; Sit and Birch, 2014). This can be considered to be a favorable offer for leisure, constituted by diverse factors influencing attendance motivations (Sit *et al.*, 2003). Therefore, this ensemble of features allows us to propose the following hypothesis:

H4. Additional services and entertainment positively impact the users' intention to visit the shopping center.

Offer variety, quality, and status. Offer variety, quality, and status have been a traditional attraction issue of the shopping centers (Frasquet, 2000; Khei *et al.*, 2001; Singh and Prashar, 2013). Boatwright and Nunes (2001) suggested that consumer preferences are influenced by the perception of variety within an ensemble of selection choices. Different authors highlighted the importance for clients to count on a wide supply of products (Más Ruiz, 1999;

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Khei *et al.*, 2001; Suárez *et al.*, 2007), especially when comparing prices and quality (El-Adly, 2007) to optimize the visit experience (Singh and Prashar, 2013). In this respect, Khei *et al.* (2001) considered that the quality and variety variables are the most critical attributes to the measure of attraction factors of shopping centers. On the other hand, the status attribute is also connected to the offer variety and quality (Hollander, 1960; Gould *et al.*, 2005), which also influences the visit experience (Kim, 2001). Consequently, this ensemble of features allows to establish the following hypothesis:

H5. The offer variety, quality, and status of the shopping center positively impact the users' intention to visit the shopping center.

Methodology

The empirical study adopts a quantitative, descriptive, and casual approach, and its geographical scope is framed in Bogota, Colombia.

Survey and sample

The study of the relationships raised and the empirical contrast of the hypothesis was performed using a sample of visitors aged above 18 years. Personal interviews with a structured questionnaire were conducted at the shopping center, where surveyed individuals were located, at different hours and days of the week. The gender, age, educational level, and shopping center variables were considered. The selection procedure of the sample was not probabilistic. Specifically, surveys were conducted for convenience.

The personal surveys were conducted by a group of surveyors who were specially trained for the task; furthermore, 449 valid questionnaires were obtained in the 25 studied shopping centers that were classified as follows according to the International Council of Shopping Centers: 58 interviews correspond to the urban commercial gallery format, 63 to the small shopping center, 58 to the medium shopping center, 161 to the big shopping center, 50 to the specialized center (also called manufacturer thematic center), and finally 59 to hypermarket-based center. All shopping centers belong to the Shopping Center Association in Colombia: Acecolombia (www.acecolombia.org), with the geographical scope being Bogota, guaranteeing that the shopping centers were establishments with commercial locations, that these were recognized and longstanding in the market, and that these were adequately distanced geographically one from another.

The sample profile can be observed in Table II.

Measurement instrument

For the creation of the questionnaire, the traditional dimensions used and described previously in the theoretical body were analyzed. As a pretest, different propositions were formulated and measured in a Likert scale with five answer levels, with 1 being totally in disagreement and 5 being totally in agreement. In the pilot phase, 60 interviews to clients were conducted and, as a result, propositions with less contribution levels were eliminated. The initial 51 schemes were reduced to 27. Table II presents the indicators posed in the questionnaire.

Subsequently, as a data processing technique and based on the research objectives, the conductive analysis to prove the model was performed.

Independent and dependent factors and their measure

The independent model factors, as described in the establishment of hypothesis, are offer variety, quality, and status; mobility and accessibility; additional services and entertainment;

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| EJMBE 26.2 | Classification data | % |
|--|--|--------------------------------------|
| , | <i>Gender</i> Male Female | 47.7 52.3 |
| 204 | Age (years) 18-24 25-32 33-40 41-50 More than 50 | 39.2 20.7 12.2 13.3 14.3 |
| Table II. Sample characterization | <i>Educational level</i> Elementary school Middle school Technician Professional Postgraduate Source: Own development | 2.9 17.8 14.3 55 10 |

physical environment, cleanliness, security, and information; and design and eco-natural environment. Their composition is described as follows.

Offer variety, quality, and status. This factor includes measures related to products and brands available in the shopping center and comprises six items. The items used include offer and store variety as well as the presence of well-known brands, a variety of store products and brands, quality of the products, and presence of exclusive and prestigious clothing brands.

Mobility and accessibility. This factor includes measures related to accessibility and mobility for people inside the shopping center and comprises five items. The questions used focused on measuring the freedom of movement and orientation in the shopping center, the perception of available space for walking, and the ease of access and comfort while shopping in the stores and the shopping center.

Additional services and entertainment. This factor includes measures related to food services, movies, relaxation, and the price-quality relation of such services. It comprises five items.

Physical environment, cleanliness, security, and information. This factor includes measures related to the perception of the physical environment and cleanliness inside the shopping center, including the perception of safety, data points, and air quality. It comprises five items.

Design and eco-natural environment. This factor includes measures related to space disposition and natural settings with vegetation, and it comprises four items. The questions used focused on measuring the perception of natural scenarios, the presence of settings with vegetation, the eco-environmental design of the shopping center, and the perception of using an architecture that includes natural materials.

The dependent model factor, which expresses the attractiveness to visit, has been denominated as the intention to visit. Such concept belongs to the area of future behavioral intentions (Dwyer *et al.*, 1987; Robert and John, 1982; Wakefield and Baker, 1998; Bigné and Andreu, 2004) and describes the peoples' desire to visit the shopping center (Iturriagagoitia and de Madariaga, 2010; Anselmsson, 2006). This factor, intention to visit, includes measures related to the probability of visiting a shopping center. It comprises two items oriented to measure the preference to visit and the enjoyment of and motivation for visiting the shopping center. The content of the questions expresses the will of the users to visit and frequent the shopping center, modulating the purpose of the assessed dimension.

Results

The dependent factor or intention to visit and the independent factors with a potential relation with it were identified. Subsequently, the convergent validity and the discriminant validity of the scales were analyzed by calculating the corresponding composite reliability (CR), the average variance extracted (AVE), and the discriminant matrix through partial least squares (PLS) (Hair *et al.*, 2006). Finally, the relations between the endogenous and exogenous latent variables were analyzed to validate the structural equation model defined previously, using the statistical package AMOS 23.0 from IBM.

Preliminary analysis

To find the underlying structure of the factors and examine the multidimensionality of the measurement instrument, an exploratory study was conducted on SPSS v22. To detect if the items would precisely measure each factor, all dependent and independent variables were included in the factorial analysis. Bartlett's sphericity test was significant ($\chi^2 = 6,580,318$, gl = 351, p < 0.001). The Kaiser-Meyer-Olkin's sampling adequacy measure of 0.903 exceeds the minimum limit of 0.50 proposed by Kaiser (1974). During the factorial analysis, six factors with individual values higher than 1.0 were identified, which explains 65.8 percent of the variance and which exceeds the limit of 45 percent recommended by Netemeyer *et al.* (2003). The out coming solution was interpreted to apply a varimax rotation (see Table III).

| | | | Comp | onents | | |
|---|--------|--------|---------|---------|---------|--------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Presence of well-known brands stores | 0.797 | | | | | |
| The offer of exclusive and prestigious clothing brands | 0.787 | | | | | |
| Variety in available stores | 0.750 | | | | | |
| Variety in offer and merchandise | 0.726 | | | | | |
| Quality of displayed products | 0.655 | | | | | |
| Feeling of status | 0.625 | | | | | |
| Natural spaces or scenarios | | 0.898 | | | | |
| Presence of settings with vegetation | | 0.894 | | | | |
| Design and eco-natural environment of the shopping center | | 0.885 | | | | |
| Use of natural materials in the architecture | | 0.847 | | | | |
| Freedom of movement inside the shopping center | | | 0.797 | | | |
| Available space for walking | | | 0.711 | | | |
| Easy access to the shopping center | | | 0.693 | | | |
| Easy orientation when walking in the shopping center | | | 0.542 | | | |
| Comfortable commercial establishment to shop | | | 0.311 | | | |
| Restaurants and cafeterias availability | | | | 0.840 | | |
| Food court availability | | | | 0.807 | | |
| Movie theater availability | | | | 0.543 | | |
| Good relationship between price and quality of product and services | | | | 0.472 | | |
| Relaxation areas availability (chairs, sofas) | | | | 0.313 | | |
| Air quality inside the shopping center | | | | | 0.392 | |
| Look and cleanliness of the bathrooms | | | | | 0.782 | |
| Security level perceived in the shopping center | | | | | 0.642 | |
| Cleanliness and order inside the shopping center | | | | | 0.632 | |
| Point of information availability | | | | | 0.387 | |
| Frequency attendance | | | | | | 0.539 |
| Enjoyment when frequenting the shopping center | | | | | | 0.538 |
| Notes: Extraction method: main component analysis; rotation meth | od: Va | rimax | with K | aiser n | ormaliz | ation; |
| sphericity test: 6580.318:351 df $p < 0.001$ | 00.049 | percen | ι, πινι | J = 0.9 | oo. Dal | ueu s |

Table III. Exploratory factorial analysis

Attraction factors of shopping centers The intention to visit factor (4.6 percent) comprises two items with acceptable loads. The offer, quality, and status variety factor (17.4 percent) comprises six items with higher loads. The design and eco-natural atmosphere factor (14.6 percent) comprises four variables with high factorial loads in the matrix of rotated components. The mobility and accessibility factor (11.6 percent) comprises five variables. Among these, the variable of comfort while shopping, which should be included in the offer variety factor was included in the mobility factor due to its comfort definition. The additional services and entertainment factor (8.9 percent) comprises five items related to food, movies, the quality-price relation of these services, and relaxation areas. This last variable was associated with this dimension due to its definition. Apparently, the load was not high (0.3). However, considering the sample size, it was considered to be enough. Finally, physical atmosphere, cleanliness, security, and information factor (8.7 percent) comprises five items related to such variables along with the air quality.

Model and data adequacy

For the model adequacy, a traditional structural equation approach was adopted for a reflective measurement model (Valdivieso, 2013; Henseler *et al.*, 2009; Bollen, 1989) by following the steps suggested in the literature (Hair *et al.*, 2011; Diaz *et al.*, 2010; Kline, 2005).

The primary concern for data processing relates to the size of the sample depending on the number of relations to be assessed. Chin's widely used golden rule states that the sample size must be 10 times greater than any of these two alternatives latent variable or factor with the largest number of indicators or dependent variable with the most significant number of independent variables influencing it.

In our model, the first possibility equals six (product variety, quality, and status), while the second one equals five (the number of arrows closer to the intention to visit). Therefore, the minimum sample size is $6 \times 10 = 60$, and our sample contains 449 cases. Additionally, the power test for the dependent variable (R2) for the case with five predictors, $\alpha = 0.005$, and a moderate effect size of 0.15 were calculated. The minimum level for social sciences is 0.8 (Cohen, 1988). Results revealed a statistical power $(1-\beta)$ above 0.95.

Reflective model assessment: PLS measurement instrument validity and reliability

Regarding convergent validity, bootstrapping technique with no sign change was used for more than 5,000 samples. Then, results with a sign change and individual changes were compared to the constructs. Significance testing at a 0.05 level was used. Results were consistent across the three methods; with the exception of two indicators (see below), no similar charges or charges below 0.06 were obtained.

This is the usual criteria when assessing the existence of convergent validity of indicators of the reflective constructs. Our case included the following: variety, quality, supply, and status (C1); eco-natural environment and design (C2); mobility and accessibility (C3); additional services and entertainment (C4); and physical environment, maintenance, security, and information (C5). Indicators with a load of above 0.7 were acceptable (Carmines and Zeller, 1979) though some authors suggested a lower limit (around 0.6) (Bagozzi and Yi, 1988). Regarding formative constructs – the intention to visit (C6) – validity was assessed from the weights, with statistical significance criteria, instead of size and absence of multicollinearity (Chin, 1998).

As shown in Table IV, all indicators load above 0.7 within their respective reflective constructs, except for two indicators that load below 0.6. They are rest area availability (0.557) and information point availability (0.600). Both signs were removed from the analysis. Furthermore, an analysis on the cross-loadings of indicators with all latent variables did not show any sign that needed a change in its construct.

Construct reliability was evaluated through two indicators: Cronbach's α (CA) and the common criteria, equal to or above 0.7, by Nunnally and Bernstein (1994) and CR

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| Indicator | C1 | C2 I | Loadin C3 | g C4 | C5 | Weight (FIV) C6 | <i>t</i> -value (bootstrapping) | factors of |
|--|----------|----------|--------------|----------|---------|--------------------|------------------------------------|------------------------|
| Well-known stores | 0.799 | | | | | | 38.429* | shopping |
| Exclusive clothing | 0.793 | | | | | | 37.761* | centers |
| Variety of stores | 0.778 | | | | | | 34.871* | |
| Variety of the offer and merchandise | 0.746 | | | | | | 27.695* | 005 |
| Quality of exhibited products | 0.791 | | | | | | 39.861* | 207 |
| Sensation of status | 0.764 | | | | | | 32.813* | |
| Natural spaces or scenarios | | 0.909 | | | | | 76.774* | |
| Environments with vegetation | | 0.911 | | | | | 87.584* | |
| Eco-environmental design | | 0.923 | | | | | 113.02* | |
| Architecture integrating natural elements | | 0.897 | | | | | 76.400* | |
| Easy access and movement within the | | | 0.766 | | | | 25.836* | |
| shopping center | | | | | | | | |
| Space for walking | | | 0.647 | | | | 14.968* | |
| Easy access to the Shopping Center | | | 0.686 | | | | 17.786* | |
| Suitable orientations | | | 0.712 | | | | 22.915* | |
| Comfortable stores | | | 0.730 | | | | 24.040* | |
| Availability of restaurants and cafes | | | | 0.832 | | | 36.941* | |
| Availability of food areas | | | | 0.836 | | | 40.929* | |
| Availability of movies | | | | 0.669 | | | 16.376* | |
| Good quality/price relationship of | | | | | | | | |
| products and services | | | | 0.734 | | | 22.245* | |
| Air quality | | | | | 0.702 | | 21.666* | |
| Bathroom maintenance | | | | | 0.684 | | 18.043* | |
| Perceived level of security | | | | | 0.776 | | 33.270* | |
| Cleanliness and maintenance | | | | | 0.772 | | 25.586* | |
| Frequent visitor** | | | | | | 0.298 (2.394) | 3.576* | Table W |
| Likeness to visit the shopping center | | | | | | 0.754 (2.394) | 10.156* | Loadings and weights |
| Notes: * <i>t</i> significant value for $h < 0.001$: | **the o | correlat | tion be | tween | the two | items that ma | ke up component | of indicators in the |
| 6 is significant at 0.01 level which is why t | his iten | n has b | een ke | pt in th | e forma | ation of the fact | or in coherence to | model's reflective and |

the sense of the construct

formative constructs

(Werts et al., 1974; Fornell and Larcker, 1981) for reflective constructs (Chin, 1998). For CR, results around 0.6 were acceptable (Bagozzi and Yi, 1988). Hair et al. (2012) suggested that assessing both criteria, CA and CR are good alternatives. As shown in Table IV, all constructs were above the minimum limits for CA = 0.7 and CR = 0.60. These authors also suggested a minimum AVE limit of 0.5 as a measure of convergent validity between reflective constructs, which was achieved by all constructs. Fornell and Larcker (1981) recommended an additional verification on the subject of discriminant validity: the square root of AVE must be bigger than the correlations between latent variables; this is accomplished by the results (see Table V). Moreover, a hetero trait-mono trait (HTMT) study (Henseler et al., 2015) was conducted to assess discriminant validity. All HTMT ratios in absolute value were below the 0.90 limit, indicating that discriminant validity is present between all the pairs of reflective constructs.

Relation between factors of attraction and the intention to visit shopping centers

The assessment and construction of the structural model were conducted using the AMOS software by using ordinal variables, as exposed before, without the need to fulfill the multivariate normality assumption. Bollen (1989) and Jöreskog and Sörbom (1996) recommended using polychoric correlations together with the weighted estimates and generalized least squares estimates. To evaluate the fit of the model, the χ^2 ratio to the EJMBE degrees of freedom (CMIN/DF), the corresponding adjustment index, the goodness of fit index (GFI), and the adjusted goodness of fit index (AGFI) were suggested. About residuals, the RMSEA mean squared error was proposed, as described below.

Initial model adjustment

First, the maximum likelihood estimation technique was used. Specific indicators showed adjustment difficulties (CMIN/DF = 6.203, GFI = 0.740, AGFI = 0.687, RMSEA = 0.108). With these model fit indicators and given that the multivariate normality assumption is not satisfied, the generalized least squares method was used instead. The following values were obtained for indicators: CMIN/DF = 2.843; GFI = 0.863, AGFI = 0.835, RMSEA = 0.064; these results led to a re-specification of the previous model.

Model re-specification

Finally, some observable variables correlating with other exogenous latent variables were found and deleted for the model's fit, as shown in Figure 1.

The a priori model shows a causal relation among exogenous variables, supply, design and eco-natural environment, mobility and accessibility, entertainment and services, and physical environment with the endogenous variable of intention to visit. However, based on the studies by Suárez (2016) and El-Adly (2007), the respecified model considers no relation between factors such as mobility and accessibility and entertainment and additional services with the intention to visit. Similarly, based on the results obtained by Hira and Mehvish (2012) regarding the importance of the accessibility and mobility variable, indirect effects of the variables supply, design and eco-natural environment, entertainment and services, and physical environment were proposed through the latent variable mobility and accessibility.

Goodness of fit measures of the respecified model

As mentioned before, there are different indexes to guide the goodness of fit using the SEM technique and, more specifically, using covariances. In addition, given the diverse implications and complexities of this process, different values are proposed to make a decision regarding the validity of the structural model (Kerlinger and Lee, 2002). This approach seems to be flexible in the limit values suggested by experts.

For this study and after some model adjustments, the following value was obtained for the most common indicators: CMIND/GL = 1.885. Schumacker and Lomax (2004) suggested that values below 3 are acceptable; GFI = 0.958 and AGFI = 0.933. Browne and Cudeck (1993) suggested that values greater than 0.90 are acceptable. Finally, the RMSE, which represents the square root mean or residual covariance mean, was analyzed; in this indicator, 0 represents a perfect fit, but the maximum is unlimited. According to some researchers, RMSE must be below 0.08 (Browne and Cudeck, 1993); ideally, it must be below 0.05 (Steiger, 1990).

| | | СА | CR | AVE | Correl | ations m Larcker | atrix – F criteria | rornell | |
|---|---|--|--|--|--|---|----------------------------------|-------------------------|----------------|
| Table V. Reliability of convergent and discriminant validity analysis of constructs with PLS | Physical environment, maintenance and security Design and eco-natural environment Mobility and access Additional services and entertainment Product variety, quality and status Intention to visit | 0.718 0.931 0.760 0.773 0.871 - | 0.824 0.951 0.835 0.853 0.902 - | 0.540 0.828 0.503 0.594 0.606 - | 0.735 0.293 0.594 0.411 0.470 0.489 | 0.910 0.284 0.312 0.239 0.392 | 0.709 0.435 0.563 0.506 | 0.771 0.570 0.442 | 0.779 0.610 |



Alternatively, RMSE's maximum confidence interval should not exceed 0.08 (Hu and Bentler, 1998), in this case, the range was found to be between 0.032 and 0.055, where RMSE = 0.044, satisfying the values suggested by the experts.

Parameter estimation

The estimated results for latent variables are presented below. Although an adequate adjustment can be performed, this does not necessarily imply a good relation between the studied variables. Estimators of the relations between the different exogenous and

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endogenous variables as well as their respective standard error, standardized estimate (C.R), and *p*-values are presented in Table VI.

Table VI shows that the intention to visit is significantly affected by latent variables, supply, design and eco-natural environment, and physical environment; mobility and accessibility (p < 0.225) and entertainment and services (p < 0.885) do not significantly influence the dependent variable intention to visit, as discussed above in the model re-specification.

Other important relations between latent variables were also detected. Thus, the mobility and accessibility variable is significantly influenced by design and eco-natural environment, physical environment, and supply variables. Furthermore, entertainment and additional services variable are close to statistical significance (p < 0.054). Table VII shows the relation between the exogenous variables and their constructs. Thus, the first column shows non-standardized estimates of the relations between the variables on the right compared with the ones of the left. When the estimation value equals 1, it indicates that this restriction was placed in one of the equations in all latent variables to calculate the model's structural relation.

Therefore, exogenous latent variables are measured with the following items, all of which are statistically significant:

- supply and variety: variety of available shops, offer, and/or merchandise;
- design and eco-natural environment: natural spaces or scenarios and environments with vegetation and architecture;

| | Relations | Estimations | SE | CR | Þ |
|----------------------|---|-------------|-------|--------|-------|
| | Mobility and access \leftarrow entertainment and services | -0.102 | 0.053 | -1.928 | 0.054 |
| | Mobility and access \leftarrow design and eco-natural environment | 0.136 | 0.034 | 3.979 | 0.001 |
| | Mobility and access \leftarrow physical environment | 0.472 | 0.076 | 6.213 | 0.001 |
| | Mobility and access \leftarrow offer | 0.205 | 0.055 | 3.697 | 0.001 |
| | Intention to visit \leftarrow offer | 0.420 | 0.075 | 5.572 | 0.001 |
| Table VI. | Intention to visit \leftarrow design and eco-natural environment | 0.276 | 0.047 | 5.939 | 0.001 |
| Estimators and their | Intention to visit \leftarrow physical environment | 0.371 | 0.113 | 3.297 | 0.001 |
| importance for | Intention to visit \leftarrow mobility and access | 0.151 | 0.124 | 1.214 | 0.225 |
| endogenous and | Intention to visit \leftarrow entertainment and services | -0.010 | 0.071 | -0.144 | 0.885 |
| exogenous latent | Intention2 \leftarrow intention to visit | 1.000 | | | |
| variables | Intention1 \leftarrow intention to visit | 0.979 | 0.060 | 16.368 | 0.001 |

| | Relations | Estimation | SE | CR | þ |
|------------------------------------|---|----------------|----------------|--------|--------|
| | Ofer3 ← offer | 1.063 | 0.094 | 11.361 | 0.001* |
| | Oter4 ← offer Ecolog4 ← Design v Eco-natural environment | 1.000 1.000 | | | |
| | $Ecolog2 \leftarrow Design \ y \ Eco-natural environment$ | 1.043 | 0.045 | 23.254 | 0.01* |
| | Ecolog1 \leftarrow Design y Eco-natural environment Movili5 \leftarrow mobility and access | 0.989 | 0.046 | 21.542 | 0.001* |
| | Movili4 ← mobility and access | 0.963 | 0.102 | 9.408 | 0.001* |
| | Entreteni2 \leftarrow entertainment and services | 1.160 | 0.114 0.113 | 10.148 | 0.001* |
| | Entreteni1 \leftarrow entertainment and services | 1.000 | | | |
| Table VII | AmbFis3 ← physical environment | 0.901 | 0.082 | 10.932 | 0.001* |
| Estimators and their | AmbFis2 \leftarrow physical environment Intencion2 \leftarrow intention to visit | 0.950 1.000 | 0.087 | 10.858 | 0.001* |
| importance for exogenous latent | Intencion1 \leftarrow intention to visit | 0.979 | 0.060 | 16.368 | 0.001* |
| variables from observations | Note: *Significant at $p < 0.05$ Source: Self-elaboration | | | | |

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- mobility and accessibility: freedom of motion within the shopping center, ease of access to the shopping center, and precise orientations for walking areas;
- entertainment and services: availability of restaurants and cafes as well as food areas;
- physical environment: appearance and cleanliness of the bathroom areas, perceived level of security of the shopping center, and cleanliness and order inside the shopping center; and
- in a view to explain the endogenous variable intention to visit, the following item was also considered: possible frequent visitor.

Discussion

Assessing a shopping center's attractiveness is crucial as this aspect is closely related to the intention to visit (Michon *et al.*, 2005). Measuring attraction factors is fundamental for companies developing their economic activity in highly competitive markets such as retail distribution (Munuera and Cuestas, 2006). However, these factors are rather diverse, and there is no agreement regarding quality and typology (North and Kotze, 2004). Such factors are formulated and analyzed according to the objectives of each study, which can be categorized in the research lines of supply/offer, accessibility, services, and environmental components, as noted in the literature review.

Consequently, results obtained from the proposed structural model show a good overall adjustment, and their psychometric properties meet the criteria accepted in the marketing literature. These results support the existence of discriminant validity between shopping centers' attraction factors and, consequently, the validity of most of the proposed working hypotheses, especially when demonstrating the structural relation between design and eco-natural environment and the intention to visit, the main contribution of this study. The implications of each theory are discussed below.

Acceptance of *H1* corresponds to previous findings regarding the positive and moderately significant contribution of physical environment to the consumer's intention to visit shopping centers (Biehl-Missal and Saren, 2012; Bigne *et al.*, 2006; Sierra *et al.*, 2000). The perceived safety indicator articulated in this dimension was already formulated by Berman and Evans (1995) when discussing the need to include this type of environmental variables in the study of the shopping centers' attraction factors. Additionally, they suggested that including the human component, employee appearance and the use of uniforms are two variables that can favor the perception of security. In our opinion, the presence of uniformed employees (security, attention, and maintenance employees) inside the shopping center, added to the appearance of the visitors themselves, are relevant variables regarding physical environment. International publications support the influence of physical environmental variables on consumer's opinion and buying behavior (Jha and Singh, 2014; Mishra *et al.*, 2014).

Regarding the acceptance of *H2*, which is the main contribution of this research, we verified the significant and positive effect of design and eco-natural environment on the intention to visit. This factor is a consequence of the visitors' interest toward the environment. Thus, aspects such as the display of vegetation, architecture with natural elements, natural spaces or scenarios, and the perception of eco-environmental design influence the attractiveness factor, which motivates customers to return and become frequent visitors. Maximization of the visitor's experience through environmental resources was suggested by Dewey (1922), who believed that there must be an interrelation between human beings and their environment. Specifically, the study of this variable or factor has a particular influence on consumer experience and behavior (Amérigo *et al.*, 2013; Brengman *et al.*, 2012; Do Paço and Raposo, 2009), which makes it a valuable resource in the

Attraction factors of shopping centers field of commerce. Furthermore, the literature indicates that the design and composition of the ecological-commercial environment is an important research topic (Söderlund and Newman, 2015; Dover, 2015; Brengman *et al.*, 2012). This demonstrates the need for more empirical works to prove their influence.

It was not possible to empirically prove H3, concerning the relations between mobility and accessibility with the intention to visit, and H4, regarding the relation between entertainment and additional services factor and the intention to visit. Obtained results do not directly confirm these relations; nevertheless, the adjusted model allows to evidence indirect effects of the offer/supply, design and eco-natural environment, entertainment and services, and physical environment variables through the mobility and accessibility variable. That is, obtained results suggest that the accessibility and mobility construct mediates or moderates the effects of each of the attraction factors on the intention to visit, an issue that needs to be confirmed or dismissed in future research as it had not been considered in the initial conceptual framework.

H5, regarding the positive effect of variety, quality, and status of the shopping center, was proved to be most significant while considering shopping center's attractiveness. These effects have been discussed by different authors (Khei *et al.*, 2001; Gould *et al.*, 2005; Rajagopal, 2009) who consider supply/offer quantity and quality, including available stores and brands, to be fundamental elements regarding the shopping center's attractiveness. Kim (2002) also discussed the relations of the characteristics of the offer with the social value for the consumer, which can mold the preference and behavior of consumers toward the shopping center in accordance with the dominant image of sophistication associated with it (Michon *et al.*, 2015). In our opinion, shopping centers do not only have an offer based on the quantity, variety, and quality of the articles and services delivered but also suggest images or perceptions of status from the brands marketed in these spaces.

Conclusions, limitations, and future research lines

Park (2016), Baker and Wakefield (2012), and Howard (1997) considered that shopping centers are, by definition, spaces with a high level of design of the commercial environment. In this case, as evidenced in the results of this research, consumer behavior is influenced by variables that can be understood from the field of study of environmental psychology as it deals with the relation between human behavior and physical environment (Dewey, 1922; Mehrabian and Russell, 1974; Heimstra and McFarling, 1978; Kaplan and Kaplan, 1989; Kaplan, 1995). Meanwhile, Jiménez *et al.* (2015), Amérigo *et al.* (2013), Suárez and Gumiel (2012), and Herzog and Strevey (2008) suggested that environmental psychology analyzes the influence of environmental, physical stimuli on human behavior.

Park (2016) stated that people visit shopping centers for several reasons such as buying the product they need or enjoying the shopping center's atmosphere and environment. In this sense, shopping centers compete for customers' attention; thus, they must allow for memorable experiences, with attraction variables favoring sensations, feelings, cognitive, and emotional responses associated with the experience of each shopping center (Brakus *et al.*, 2009; Srinivasan and Srivastava, 2010). In this manner, a particular consumer response and an increase in the purchase probability can be achieved (Spence *et al.*, 2014; Turley and Milliman, 2000; Kotler, 1973).

With regard to business implications, identification of specific empirical findings related to the way attraction factors work allows marketing directors and managers to improve their management decisions concerning design and implementation of marketing strategies, tactical decision guidance, decision-making assessment or control, and the proposal of alternative positioning attributes, such as the design, management, and arrangement of eco-natural environments that allow to increase the number of visits and purchases within these establishments.

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The main conclusion of this study was to empirically include and demonstrate the influence of design and natural eco-environment on the intention to visit, along with other elements considered in previous investigations. This effect highlights the need to consider the relations among shopping centers' design, environment and ecological architecture, and consumers' behavior. In this sense, the literature provides a research line regarding the effect of biophilic architecture, which suggests that people need to be in permanent contact with ecological or natural spaces (Beatley, 2011; Appleton, 1975). These spaces or environments offer multiple psychological, social, environmental, economic, leisure, and production benefits (Söderlund and Newman, 2015). Therefore, the design of ecological spaces and environments has the potential of becoming a field of interest for the commercial management of shopping centers, given its potential effect on visiting and shopping intentions (Wolf, 2005; Joye *et al.*, 2010). This is particularly because it provides favorable effects on positive emotional states such as pleasure and well-being (Brengman *et al.*, 2012).

We believe that given the limitations of this research, a generalization of our results should be made with caution. No further information on the treatment of this attraction factor regarding shopping centers was observed throughout the literature review conducted in this study. Therefore, findings and implications need to be examined in future research. Additionally, although the sample and sample units are considered to be large enough for Bogota, the sample is not random. Furthermore, this population does not represent all customers or users of different types of shopping centers, all customer profiles, or all possible geographical locations, segmentation, and specialization issues that were not considered in the search.

However, despite these limitations, we consider that this study provides relevant information to the body of knowledge about the commercial management of retail establishments and their attraction factors. In this light, it would be interesting to include information that compares the relation between design and green environment with the consumer's emotional states in future studies, given the limited information found in the literature. It would also be important to further expand the study of the relation between the attraction factors and the profiles of current and/or potential consumers. Finally, we recommend including hierarchical questions to relate attraction factors to visitor profiles, geo-demographic information, and format typology of the establishment for possible multigroup analysis according to size, supply, and proximity criteria.

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Application of geographical information systems for the optimal location of a commercial network

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Abstract

Purpose – The purpose of this paper is to study the optimization of the geographical location of a network of points of sale, so that each retailer can have access to a potential geographic market. In addition, the authors study the importance of the distance variable in the commercial viability of a point of sale and a network of points of sale, analysing if the best location for each point (local optimum) is always the best location for the whole (global optimum).

Design/methodology/approach – Location-allocation models are applied using p-median algorithms and spatial competition maximization to analyse the actual journeys of 64,740 car buyers in 1240 postal codes using a geographic information system (GIS) and geomarketing techniques.

Findings – The models show that the pursuit of individual objectives by each concessionaire over the collective provides poorer results for the whole network of points of sale when compared to coordinated competition. The solutions provided by the models considering geographic and marketing criteria permit a reduction in the length of journeys made by the buyers. GIS allows the optimal control of market demand coverage through the collaborative strategies of the supplying retailers, in this case, car dealerships.

Originality/value – The paper contributes to the joint research of geography and marketing from a theoretical and practical point of view. The main contribution is the use of information on actual buyer journeys for the optimal location of a network of points of sale. This research also contributes to the analysis of the correlation between the optimum local and optimum global locations of a commercial network and is a pioneering work in the application of these models to the automotive sector in the territorial area of the study. **Keywords** Geomarketing, Automotive, Geographical information system (GIS), Location-allocation model, Zip code

Paper type Research paper

JEL Classification - M31, M10, R11

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1. Introduction

There is increasing interest in the potential opportunities arising from extracting spatial information from large data sets (Comber *et al.*, 2016). Approximately 75 per cent of the data used by business decision makers include at least one spatial component, such as customer address, geographic distribution of population, market coverage or commercial area (Ozimec *et al.*, 2010).

Geomarketing is a discipline that has been developed to make decisions according to geographical and marketing criteria (Rodríguez *et al.*, 2015). Geomarketing uses statistical geometry, defined by Goodchild (2008) as the application of probabilistic methods to geometric forms. For any geomarketing study, a geographic information system (GIS) is needed: "a computer application capable of creating, storing, manipulating, visualizing and analysing geographic information" (Goodchild, 2000, p. 6). This link between attributes and geography is a distinctive feature of GIS (Goodchild, 1991). GISs are widely applied in developed countries, such as the USA or Great Britain (Allo, 2014). Their widespread use has made them a tool for sharing and communicating knowledge about the earth's surface (Sui and Goodchild, 2011). Although geolocation systems are highly developed, scarcely any work on geomarketing has been done, creating an opportunity for research in this area (e.g. Ozimec *et al.*, 2010; Comber *et al.*, 2016). There is also an increasing interest in visualizing and analysing spatio-temporal data through geo-intelligence tools (Bozkaya and Singh, 2015; Altshuler *et al.*, 2015; Lucas *et al.*, 2015).

In this context, the present work aims to contribute to the joint research of geography and marketing from a theoretical and practical standpoint. To this end, the main objective is to study the optimization of the geographical locations of a network of points of sale, so that each retailer can have access to a potential geographic market. From the main goal, the following secondary objectives can be derived:

- to detect the impact of the distance variable in the commercial viability of a point of sale and a network of points of sale, analysing if the best location of each point (local optimum) is always the best location for the entire network (global optimum); and
- to evaluate the usefulness of geomarketing and GIS in the development of commercial networks and analyse whether their application improves access to potential markets.

This paper shows in a theoretical and practical way the importance of analysing economic and geographic variables together for the optimization of a commercial network, applying geomarketing techniques through the use of GIS. For this, we study the actual journeys of 64,740 car buyers, and the number of points of sale and their locations are optimized. The main contribution of this paper is the use of real journey information to evaluate the location of a network of points of sale. While most studies use statistical estimates of buyer journeys (e.g. Cardozo *et al.*, 2010; Buzai, 2011; Casado and Palacios, 2012), this research also provides an analysis of the correlation between the optimum local and optimum overall locations in a commercial network. This paper is also a pioneer in the application of these models in the industry and in the territorial area of study.

2. Theoretical framework

The social sciences, especially geography, make a profound re-evaluation of the concept of territory based on their multiple manifestations (Fonseca *et al.*, 2016). It should be noted that in the field of geography "there is a long tradition of finding the optimal solutions to design problems in the research domain known as spatial optimization" (Goodchild, 2010, p. 10). Spatial dependence has already been defined through Tobler's (1970) first law: all things are related, but closer things are more closely related than distant things. Although the nature of spatial mobility is obvious, it has often not been considered for the design of journeys (Loidl *et al.*, 2016).

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Since the 1960s, various studies have been conducted to assess the influence of geographic distance on buyers. One of the pioneering studies was by Bishop and Brown (1969) on food buying habits in the year 1966. These authors concluded that a significant number of clients are subject, for one reason or another, to some form of spatial monopoly.

Recently, other authors have re-emphasized the importance of considering geographical criteria in organizational decisions (e.g. Chasco, 2003; Ozimec *et al.*, 2010; Buzai, 2011; Gutiérrez-Gallego *et al.*, 2012; Allo, 2014; Altshuler *et al.*, 2015), and different GISs have been developed for spatial behavioural analysis (e.g. Loidl *et al.*, 2016; Fonseca *et al.*, 2016).

For business decision makers, the location of facilities to achieve the greatest coverage has long been a major concern (Tong, 2012). One approach is to use location-allocation models that optimally locate facilities and allocate demand to each of the points of sale (Zeng *et al.*, 2009). In this way, location-allocation models investigate the need for additional service centres, the optimal relocation of existing service centres or the effects of a reduction in the number of centres (Jong de and Tilema, 2005). Geomarketing has entailed the application of these techniques to identify "hot" areas with greater commercial attractiveness for companies (Cardozo *et al.*, 2010). The competitive advantages of good locations for a network of points of sale are obvious, since, from these locations, a spatial dependence with the environment is created (López and Chasco, 2007).

Table I presents a synthesis of research in the field of geomarketing.

The theoretical framework highlights the importance of spatial attributes, since geographical proximity facilitates the formation of important links with suppliers (e.g. Ganesan *et al.*, 2005). However, even though the automotive sector is strategic within the aggregate of the Spanish economy (Moral-Rincón, 2004; Levy Mangin *et al.*, 2007; Moyano-Fuentes and Martínez-Jurado, 2012; Makarova *et al.*, 2012; González *et al.*, 2013; Busse *et al.*, 2016), there has been a lack of research into the spatial relationship between dealer networks and vehicle buyers. Therefore, from an economic-geographical conception, the following hypotheses are proposed for the automotive sector:

- *H1.* The application of location-allocation models allows the optimal location of a network of points of sale.
- H2. Consumer journeys affect the optimal location of a network of points of sale.

There exist numerous academic works based on competition between various points of sale (Bigné and Vila, 2000; Altshuler *et al.*, 2015; Bucklin *et al.*, 2008; Buzai, 2011; Calero, 2004; Flaherty and Pappas, 2002; Chan *et al.*, 2007; Diez and Escalona, 2001; Donthu and Rust, 1989; Drezner, 1994; Mittal *et al.*, 2004; Moreno, 2003; Rodríguez *et al.*, 2015; Yasenkovsky and Hodgson, 2007; Zeng *et al.*, 2009), but it is the research of Chan *et al.* (2007) which highlights an interesting aspect based on the competition model of Bertrand. In this competitive model:

- companies do not cooperate;
- firms compete on the basis of their distance from the buyer (in this study, price is not considered a determinant variable but distance is considered so); and
- consumers purchase products at the nearest point of sale.

Academic works have been conducted in which location-allocation models and spatial competition maximization models have been applied. In these models, priority was given to the interests of each individual bidder-competitor over the collective (Moreno and Buzai, 2008). In this paper, we analyse whether the location of each dealership should be considered in relation to the other points of the sale in the network (Chan *et al.*, 2007), so the following hypothesis is proposed:

H3. The optimal solution for each point of sale (local optimum) is optimal for the entire network (global optimum).

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| Research objective | Methodology | Conclusions | Source | information |
|---|---|---|---|---------------------------------|
| <i>Geomarketing</i> To analyse the utility of geomarketing techniques To demonstrate the importance of geomarketing | Theoretical review Gravity model and | Geomarketing aids rational decision making in developing countries The location of "shadow zones" in commercial naturals, can be solved by | Allo (2014) Calero (2004) | systems |
| in commercial distribution | Multinoiniai Logit | GIS | | 223 |
| To analyse the utility of the variogram function | Variogram function | Development of a spatial instrument combining analytical and graphical analysis | Chica Olmo and Luque Martínez (1992) | |
| To analyse the cost of land in the City of Granada Eliminate the uncertainty in spatial analysis | Residual Iterative Kriging Method GIS | Development of a methodology for estimating the price and value of houses GIS are geographical decision-making tools in environments with a degree of uncertainty | Chica Olmo (1995) Goodchild (2008) | |
| Analyse the utility of GIS in Geo-design. | | GISs are valid tools for geo-design of commercial networks | Goodchild (2010) | |
| <i>Spatial problems</i> Allocation of individuals to different geographical centres | Inner group of centrality | The allocation of clients and costs to each regional unit provides improvements in marketing management and returns | Altshuler <i>et al.</i> (2015) | |
| | Location-allocation model | Optimization of the allocation of individuals to primary health care centres in Luian (Argentina) | Buzai (2011) | |
| | | GISs reduce the journey length for citizens to electoral modules in Chihuahua (México) | Casado and Palacios (2012) | |
| | | GISs allow the analysis of access to social services by the different social strata in the Republic of Philippines | Delgado and Canters (2011) | |
| | | GISs allow analysis of the differences in land use by the different social strata in Montevideo (Uruguay) | Fonseca <i>et al.</i> (2016) | |
| | | GISs allow the analysis of land use planning and the spread of land prices in Montevideo | Lozano- Botache (2016) | |
| | | Design of a location-price model of a network of petrol stations in Singapore | Chan <i>et al.</i> (2007) | |
| | | Maximization of the coverage of a network of acoustic warning stations in Dublin (Ohio) | Tong (2012) | |
| | Huff Model | Utility of the Huff Model in the analysis of the attraction capacity of chopping centres | Díez and Escalona (2001) | |
| Undesirable installations | Location-allocation | Models for the identification of | Bosque and | |
| Distribution intensity and | models Gini coefficient | undesirable installations Importance of spatial proximity of | Franco (1995) Bucklin <i>et al.</i> | |
| its effect on purchasing | Nakanishi and Costan | clients in the automotive sector | (2008) | |
| | model | installation of a new point of sale in an | DIEZHEI (1334) | T-11 T |
| | | already existing network | | Principal results of studies on |
| | | | (continued) | geomarketing and GIS |

| EJMBE 26 2 | Research objective | Methodology | Conclusions | Source |
|---------------|---------------------------------------|--|--|---|
| 20,2 | | Variance analysis | Relationship between long journeys and purchase of durable goods | Hyman (1987) |
| | | Regression model | Demonstrates the importance of geographical distance in commercial | Ganesan <i>et al.</i> (2005) |
| 224 | _ | Weighted geographic regression models | Displays different patterns of satisfaction with a network of points of sale depending on the physical and psychological factors of their clients by virtue of their geographic location | Mittal <i>et al.</i> (2004) |
| | | Location-allocation model. GIS | Models and maps spatial competition and its impact on trade | Moreno (2003) |
| | Territorial analysis | Kernel Estimator and weighted geographic regression models | Reduction of urban and rural journeys for the purchase of durable goods Analysis of the land cover generated by Geo-Wiki project on a 50 kilometres grid | Rodriguez <i>et al.</i> (2015) Comber <i>et al.</i> (2016) |
| | | Kernel Estimator | Optimization of location of hospitals | Donthu and Rust (1989) |
| | | P-Median hierarchical models and SILA | Demonstrates unequal access to health services in Ghana | Yasenovskiy and Hodgson (2007) |
| | Design of journey flows and transport | GIS | Demonstrates the validity of GIS for the design of transport flows | Loidl <i>et al.</i> (2016) |
| | - | Pickup and intercept flow models | The application of these models in the analysis of buyer journeys | Zeng <i>et al.</i> (2009) |
| | Theoretical problems | Minsum and Minmax | Demonstrates when to apply each | Carrizosa and |
| | Utility of geographic | Exploratory analysis | developed model Applications of geomarketing in the | Romero (2001) Chasco (2003) |
| | analysis | of spatial data GIS, Huff Model and LISA | Demonstrates the usefulness of the application of geomarketing in | Chasco (2012) |
| | | Location-allocation model. GIS | marketing departments Pioneering work demonstrating the progress in marketing decisions due to CIS | García-Palomo (1997) |
| | | GIS | Shows the business benefits of geographic analysis | Goodchild (1991) |
| | | | Analyses the importance of symbolization for geographic information users | Ozimec <i>et al.</i> (2010) |
| | | | Extends the validity of GIS for temporal and geographical analysis | Goodchild (2013) |
| | | Theoretical review | Retrospective analysis of the creation and evolution of GIS. | Goodchild (2000) |
| | | First order anotic! | Demonstrates opportunities offered by geographical research techniques (GRT) | Moreno (2004) |
| | | autoregressive model | between the variation of macroeconomic variables and its | Chasco (2007) |
| Table I. | | | geographic implications | |

3. Models, sources of information and data

3.1 Models

To test the hypotheses, the *p*-median and maximization models of market share or spatial competition are used.

P-median or minisum model. The *p*-median or minisum model locates a pre-set number of installations minimizing the total Euclidean distance between these and the demand points, weighting the distance between each point and installation in function of stated demand (Casado and Palacios, 2012). The results show the optimal locations that are most convenient for users, minimizing the average distance they must travel.

The mathematical formulation given by Calero (2004) for the *p*-median model is that each demand point is represented by an index *i*, where *I* is the set of all demand points. Each possible location is represented by an index *j*, and *J* is the set of all locations:

- w_i = represents the demand for goods at geographical point *I*;
- d_{ij} = is the distance between *i* and *j*; and
- x_{ii} = is the journey of a buyer from a demand point *i* to the location of the dealership *j*.

Decision variables x_{ii} satisfies the following:

- $x_{ij} = 1$ if $d_{ij} = \min \{d_{ik} | k \text{ belongs to } J\};$
- $x_{ij} = 0$ in the other case;
- $x_{ij} = 1$ if a point of sale is opened in *j*; and
- $x_{ii} = 0$ in the other case.

The objective is to minimize the distance that the buyer needs to travel to reach the point of sale. *W* is the total maximum distance weighted by demand:

$$W = \operatorname{Min}_{i \in Ij} \sum_{i \in J} xij \ wi \ dij$$

Restrictions:

$$\sum_{j \in J} xij = p \ \forall j \in J \tag{1}$$

J is the set of all locations *j* where the dealerships *p* are located:

$$X_{ij} \leqslant X_{jj} \quad \forall \ i \in I \quad \forall \ j \in J \tag{2}$$

$$W - \sum_{j} w_i x_{ij} d_{ij} \ge 0 \quad \forall \ i \in I$$
(3)

According to Buzai (2011), the objective of the *p*-median model is to minimize the sum of the total of the products of the population displacements from the points of demand (centroids of the Andalucian post codes that group the dispersed demand) to the supply points. On the one hand, we try to act on the global cost of displacement (efficiency), and on the other hand we try to minimize the maximum distances of transfer (equity).

Maximization of individual market share model or spatial competition. This model has the aim that each centre achieves the greatest demand possible (even to the detriment of other centres or the global network). The model is guided by the principle of efficiency and, unlike the previous one, does not respond to the logic of cooperation between service centres to

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achieve a global solution that prioritizes interests to demand, but privileges those of each individual bidder-competitor (Moreno and Buzai, 2008). The model seeks to maximize the selfish behaviour of each of the sales agents, giving priority to individual benefit over the collective. As defined by Carrizosa (2013):

$$\operatorname{Max}_{i} f_{i}(d(x_{i}, X))$$
$$1 \ge i \ge n$$

where *d* is the captured demand at each point x_i of the total set (*X*), i = 1, 2, ..., n are the candidate locations of each point of sale, f_i the function that maximizes the captured demand at point of sale *i*:

$$f_x(X) = w_x e^{-X^2}$$

where w_X is a decreasing function.

Market competitive services exist at points of sale $p_1, ..., p_n$.

The demand captured at each point x_i is as follows:

$$F_X(X) = w_X \frac{\frac{1}{d(x_i, X)^2}}{\frac{1}{d(x_i, X)^2} + \frac{1}{d(x_i, P1)^2} + \dots + \frac{1}{d(x_i, Pn)^2}}$$

3.2 Sources of information and data

The sources of information used in this study are the following:

- Institute of Automotive Studies of the National Association of Automobile and Truck Manufacturers for registration data from 2007 to 2011.
- Andalucian Institute of Statistics and Cartography, web page on International Postal Codes and the web page Geopostcodes.com have been used for the geographic location for the centroids of each of the postal codes collected.
- Automobiles Citroën Spain provided the sales data for each establishment and the postal codes of the customers.

The information being obtained, we began with geocoding, defined as a process of assigning map coordinates to an entity (Calero, 2004). As part of this process, the centroids of all postal codes in Andalucia were located. Subsequently, the dealerships of the base network were located geographically (Table II).

The GIS Flowmap was used for the digital representation of 64,740 actual trips of buyers to the 25 points of sale of the base network. The distance used is Euclidean. Flowmap is a programme created by the Faculty of Geographical Sciences of the University of Utrecht, which "is specialized in the visualization of data interaction, such as migration paths and flows, interaction analysis such as accessibility analysis, network analysis, and models of interaction" (Breukelman *et al.*, 2009, p. 7).

Flowmap is a spatial analysis-oriented programme that incorporates a set of tools to address various analyses, mainly the following (e.g. Maarten, 2002; Moreno and Buzai, 2008; Delgado and Canters, 2011; Buzai, 2011):

- analysis of flows between places (of goods, people or information);
- · models of spatial interaction, spatial accessibility and network analysis; and
- models of optimal location.

| Post code | Municipality | Longitude | Latitude | information |
|--------------------|-----------------------------|-----------|------------|--------------|
| 11011 | Cádiz | -625.054 | 36.479.678 | systems |
| 11205 | Algeciras | -545.781 | 36.160.762 | oy sterilis |
| 11407 | Jerez de la Frontera | -613.679 | 36.704.790 | |
| 14013 | Córdoba | -481.052 | 37.759.901 | |
| 14014 | Córdoba | -468.526 | 37.967.292 | |
| 14400 | Pozoblanco | -475.872 | 38.278.041 | 227 |
| 14900 | Lucena | -453.285 | 37.368.212 | |
| 18015 | Granada | -366.193 | 37.193.625 | |
| 18600 | Motril | -349.061 | 36.748.674 | |
| 21007 | Huelva | -690.005 | 37.298.018 | |
| 23009 | Jaén | -370.429 | 37.856.368 | |
| 23400 | Úbeda | -335.994 | 38.014.374 | |
| 23650 | Torredonjimeno | -395.926 | 37.765.430 | |
| 29004 | Málaga | -448.319 | 36.681.661 | |
| 29006 | Málaga | -449.800 | 36.710.680 | |
| 29200 | Antequera | -457.907 | 36.998.432 | |
| 29603 | Marbella | -488.635 | 36.509.940 | |
| 29640 | Fuengirola | -461.738 | 36.558.552 | |
| 29700 | Vélez-Málaga | -412.054 | 36.757.442 | |
| 41007 | Sevilla | -595.645 | 37.396.389 | |
| 41015 | Sevilla | -597.338 | 37.435.396 | |
| 41410 | Carmona | -557.559 | 37.457.564 | |
| 41560 | Estepa | -489.833 | 37.300.084 | |
| 94230 | Huércal de Almería | -246.901 | 36.886.223 | |
| 94710 | El Ejido | -277.546 | 36.783.396 | Table II |
| Note: Geographical | location of dealers in 2011 | | | Base network |

The result of the analysis carried out is shown in Figure 1. Here, thick and thinner lines are seen. The thicker lines correspond to a greater flow of journeys to that dealership.

Although the number of points of sale has remained stable, the average market per dealership has shifted from 7,406.48 private vehicles registered in 2006 to 2,589.60 in 2011 (Table III).

"Market potential" is defined as the area of average registrations that a dealer must be able to access to be commercially viable. This potential market must be large enough to make the necessary sales to cover internal expenses. It should be noted that neither the demand at the points of sale nor their internal costs are uniform, so it is necessary to apply an average covering the generality of the cases. For this average, account was taken that the year 2007 was a record year in sales at the national level and that 2008 was the first year of strong decline in vehicle registrations and, in consequence, a reduction in dealer networks (Navas, 2014; Blanchar, 2013). Due to the foregoing, we estimate what the minimum potential market volume for the viability of a dealer in Andalucia may be on average between 2007 and 2008 (see Table IV), years in which the points of sale still had access to sufficient markets.

From the minimum potential market of 5,842 vehicles, the threshold of average trips to dealers is calculated to determine the geographic area of influence that they must cover to achieve this. In this regard, the area that a network of 25 dealers in Andalucia must cover to opt for an average potential market of 5,842 vehicles in 2011 is within a radius of 57.81 kilometres on average around each dealership. If we consider that the number of points of sale of the base network is 25, by necessity some will have to "cannibalize" the areas of influence of others in the same network. To make the network viable and cover the same market, the solution would be to reduce the number of dealerships offering the selected models.



| | | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|--|---|---|---|--|------------------------------------|---------------------------|--------------------------|
| Table III. Evolution of the potential market for car dealerships in Andalucia | Number of registrations Dealerships in the network Average of dealer market Source: Own design based of | 185,162 25 7,406.48 on data from | 175,735 25 7,029.40 Institute of A | 116,391 25 4,655.64 utomotive Stu | 111,102 25 4,444.08 idies | 101,553 25 4,062.12 | 64,740 25 2,589.60 |

| | | 2007 | 2008 |
|--|--|--|---------------------------|
| Table IV. Calculation of minimum potential market for dealerships | Registrations made in Andalucia Number of dealerships in the network Market share per dealership Estimate of minimum potential market Source: Own design based on data from the Insti | 175,735 25 7,029.4 5,842.52 tute of Automotive Studies | 116,391 25 4,655.64 |

From the abovementioned, we proceed to calculate what would be the viable number of dealerships in this environment. To do this, the market for private vehicles in the year 2011 must be divided between the number of dealerships and the result must be as close as possible to those 5,842 vehicles considered as the average potential market which provides access to minimum potential market share, as shown in Table V.

| Registrations made in Andalucia Optimum number of dealerships Market per dealership | 64,740 11 5,885.45 |
|---|---|
| Market per dealership | 5,885.45 |
| I | Registrations made in Andalucia Optimum number of dealerships Market per dealership |

These calculations suggest that a network of 11 dealerships in Andalucia would be the appropriate number to reach the estimated potential market and would allow more viable market coverage for this commercial network.

4. Results

The model begins with a set of 25 points of sale locations. The application of the reduction models allows, at each stage, the progressive elimination of the locations with less influence on the market share of the network (Jong de and Tilema, 2005; Breukelman *et al.*, 2009).

Given that both the market volume and the location of the dealerships are relevant variables, the algorithm of average distance travelled by customers (p-median) and the algorithm of elimination of locations with poor results are applied through the reduction model (maximization of the individual quota) depending on the volume of registrations. Moreno and Buzai (2008, p. 136) recommend "to test the application of various algorithms, independently or combined, and compare the obtained solutions, so that the suboptimal ones can be discarded and the most successful to be accepted as the optimal one".

4.1 Selection of the eleven dealerships

To begin the process of deciding the best solution among the proposals, a comparison must be made between the solutions of the average distance algorithms and the maximization of the individual quota. In Table VI, the surviving dealerships are arrived at after both algorithms are applied (surviving dealerships are those that have not been eliminated after application of the models).

The best solution must take into account the average distances that car buyers travel in each case. In the average distance solution, the point of sale with the greatest journey is 41.14 kilometres' radius around the dealership. Meanwhile, in the solution for maximizing the individual quota, the average distance travelled by customers, in the case of the longest journey, is 35.58 kilometres' radius around the dealership. From all the above, the optimal solution is the one that eliminates the worst market results (maximization of the individual quota). The cartographic representations of the discarded dealerships, their disposal order according to their potential market share (the number that accompanies them between 1 and 14) and the surviving dealers marked with a blue dot are shown in Figure 2.

4.2 Dealership relocation model

The relocation model is applied for the optimal cartographic location of a predetermined number of installations of a given network (Breukelman *et al.*, 2009). Table VII shows the results of the different algorithms applied.

| Average distance | | Maximization of individual quota | | |
|------------------|----------------------|----------------------------------|----------------------|--|
| Post code | Municipality | Post code | Municipality | |
| 11205 | Algeciras | 11205 | Algeciras | |
| 11407 | Jerez de la Frontera | 11407 | Jerez de la Frontera | |
| 14014 | Córdoba | 14013 | Córdoba | |
| 18015 | Granada | 18015 | Granada | |
| 21007 | Huelva | 21007 | Huelva | |
| 23650 | Torredonjimeno | 23009 | Jaén | |
| 29006 | Málaga | 29006 | Málaga | |
| 41015 | Sevilla | 29603 | Marbella | |
| 41560 | Estepa | 41007 | Sevilla | |
| 94230 | Huércal de Almería | 41015 | Sevilla | |
| 94710 | El Ejido | 94230 | Huércal de Almería | |

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Table VI. Surviving points of sale



| | Maximization of competition | | Average distance over the best | | Maximization of competition over | |
|---|---|---|--|--|---|---|
| | over the average distance | | market results | | best markets | |
| | Post code Municipality | | Post code Municipality | | Post code Municipality | |
| Table VII. Relocation model solutions | 11401 14002 18014 18200 29006 29015 29692 41003 41006 41806 94230 | Jerez de la Frontera Córdoba Granada Maracena Málaga Málaga Manilva Sevilla Sevilla Sevilla Umbrete Huércal de Almería | 11202 11500 14004 21004 23630 29007 29601 41007 41930 94003 | Algeciras El Puerto de Santa María Córdoba Granada Huelva Villatorres Málaga Marbella Sevilla Bormujos Almería | 11404 11518 14013 18012 18200 29006 29603 41005 41007 41808 94230 | Jerez de la Frontera Puerto Real Córdoba Granada Maracena Málaga Marbella Sevilla Sevilla Villanueva del Ariscal Huércal de Almería |

The interpretation of the results ordered from the most to the least favourable is as follows:

- (1) Maximization of competition over the best markets: the most unfavourable case of potential market for a dealership is 4,660 vehicles. If the target that has been determined for a point of sale is access to a potential market of 5,842 vehicles, this result assumes that the point of sale has access to only 80 per cent of that potential.
- (2) Maximization of competition over average distance: the most unfavourable case of potential market is 4,619 vehicles. This result represents 79 per cent of the potential fixed market.
- (3) Average distance over better market results: the most unfavourable case of potential market is 3,416 vehicles. This result represents 58 per cent of the potential fixed market.

It has become clear that dealers cannot cover market areas in a radius of 57.81 kilometres around the dealership. Therefore, it can be inferred that customer journeys affect the optimal location of a network of points of sale. In conclusion, it can be affirmed that H2 is accepted. The first thing highlighted in the three proposals is that the optimal solutions in which the algorithm of the maximization of spatial competition has been applied do not locate points of sale in the provinces of Huelva or Jaén. Continuing with this observation, the shortest distance that the buyers of vehicles from the municipality of Huelva, the main market of this province, will have to travel to the nearest dealer (located in postal code 41806 in the municipality of Humbrete) is 82 kilometres. The shortest distance that the buyers of vehicles from the municipality of Jaén, main market of this province, will have to travel to the nearest dealership (located in postal code 18200 in the municipality of Maracena) is 88 kilometres. Therefore, the solutions given by the algorithm of maximization of spatial competition cannot be considered optimal because they leave important potential markets without coverage. In this regard, it can be affirmed that the application of the location models has allowed for the optimal locating of a network of points of sale; therefore, H1 is accepted. The optimal solution for the placement of a generalist dealer network in Andalucia is presented in Table VIII.

As a result of these findings, one can begin to relocate the dealerships (Figure 3). The longest average distance that buyers will have to travel according to this model is 34.47 kilometres' radius around the dealer.

The analysis to determine the optimal solution for a network of points of sale brings forth the following paradox: the optimal solution for individual dealerships does not coincide with the optimal solution for the whole network.

Table IX shows the results of applying the dealership relocation model and the spatial competition maximization algorithm. These locations optimize the potential markets for the

| Postal code | Municipality |
|-------------|--------------------------|
| 11202 | Algeciras |
| 11500 | El Puerto de Santa María |
| 14004 | Córdoba |
| 18004 | Granada |
| 21004 | Huelva |
| 23630 | Villatorres |
| 29007 | Málaga |
| 29601 | Marbella |
| 41007 | Sevilla |
| 41930 | Bormujos |
| 94003 | Almería |



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Global optimum solution for the location of dealerships

Table VIII.

Figure 3.

Relocation of

| EJMBE 26,2 | Postal code | Municipality |
|-------------------------|-------------|------------------------|
| , | 11404 | Jerez de la Frontera |
| | 11518 | Puerto Real |
| | 14013 | Córdoba |
| | 18012 | Granada |
| 939 | 18200 | Maracena |
| 232 | 29006 | Málaga |
| Table IX | 29603 | Marbella |
| Optimal location | 41005 | Sevilla |
| solution for individual | 41007 | Sevilla |
| dealerships in | 41808 | Villanueva del Ariscal |
| Andalucia | 94230 | Huércal de Almería |

individual dealerships but not for the total network. Therefore, we have a local optimum. This model aims to achieve the greatest amount of demand for each centre (even to the detriment of other centres or the global network). That is to say, the optimal solution of this algorithm will geographically locate the dealers in their optimal individual location, which will be the one that allows the largest market capture. This statement is consistent with the previous literature: "retail establishments polarize towards the major urban centres" (Chica Olmo and Luque Martínez, 1992, p. 127). In this case, the local optimum does not lead to a global optimum, and therefore, it can be affirmed that *H3* is rejected.

5. Conclusions

In this work, we have analysed the real journeys of buyers with the aim of optimizing the location of a network of points of sale, to contribute to the joint research of geography and marketing from the theoretical and practical point of view. Many authors have highlighted the importance of considering geographical criteria in business decisions (e.g. Ozimec *et al.*, 2010; Buzai, 2011; Allo, 2014; Altshuler *et al.*, 2015; Loidl *et al.*, 2016; Fonseca *et al.*, 2016). The optimal location of points of sale is a relevant problem within business strategy (e.g. Tong, 2012; Zeng *et al.*, 2009). The definition of a commercial network supposes a form of spatial monopoly based on the strong relations generated between suppliers and clients according to their geographical proximity (Ganesan *et al.*, 2005). In this context, previous literature has demonstrated the importance of segmenting markets based on geographic variables (e.g. Chasco, 2012; Casado and Palacios, 2012; Tong, 2012) and the usefulness of econometric analysis in the locating of points of sale (Mittal *et al.*, 2004). This work allows us to draw the following conclusions:

- The impact of the distance variable on the commercial viability of a dealership and the network to which it belongs is crucial in the optimization of the placement of the point of sale. Through GIS one arrives at the solution that maximizes the market area covered with the least points of sale. At the beginning of the study, vehicle buyers made average trips of less than 57.81 kilometres to purchase a vehicle. Knowledge of the habits of buyers when travelling to points of sale has allowed us to discard two of the three proposed solutions provided by the application of the location-allocation models, because they left areas of more than 80 kilometres uncovered.
- The algorithm of maximization of spatial competition relocation model increases rivalry between points of sale. With this function, there are locations for points of sale with access to greater potential markets than those points of sale located in the smaller commercial areas. These results were more balanced than those obtained with algorithms with cooperative strategies (*p*-median or minimization of mean distance).

- The optimum solution obtained for the whole network of points of sale (global optimum) is not the best for each point of sale (local optimum). The pursuit of individual objectives by each dealership, over the collective, provides poorer results for the whole network than with coordinated competition. These results complete the work of Chan *et al.* (2007). Nonetheless, this research demonstrates another solution that individually offers each point of sale access to more viable potential markets vs the global solution and that also makes these markets more balanced among them. It should be noted that the authors do not find any scientific documents in this line of research.
- The following conclusion is aligned with the final objective of this research: to demonstrate the usefulness of geomarketing in the development of commercial networks using real consumer journeys. From the analysis of each of the dealer's market areas, it is corroborated that knowledge of the journeys to the network of points of sale is fundamental for their optimal location, minimizing the buyers' journeys. That is to say, the joint application of the *p*-median algorithms and the maximization of the individual quota allow better access to larger potential markets by identifying geographic areas with greater commercial interest for the company. These conclusions are consistent with previous research by Bosque and García (1995), García-Palomo (1997), Goodchild (1991), Moreno (2004), Goodchild (2008) and Ozimec *et al.* (2010).
- As a final conclusion, the results show that GIS can optimally control the market demand coverage through retailers' collaborative strategies (in this case, car dealerships).

5.1 Managerial implications

The development of strategies of collaboration vs competition in the network of points of sale involves convincing the management of each point of the premise that collaboration provides the best overall solution. It is essential for the optimal location of a network of points of sale to consider the network as a whole, and not each one of the points in isolation, and that the parent company promotes actions that lead to a coordinated competition. The use of GIS is recommended with its integration into the marketing information system to anticipate the evolution of macroenvironments and microenvironments. Distance is a physical variable, known and controllable, that should be considered key in any marketing plan. Therefore, it can be concluded that location-allocation models can be of very great use to managers, and that the *p*-median model can strengthen commercial networks through their optimal positioning, while achieving major benefits for the network of dealers and for their customers.

5.2 Limitations and future lines of research

The main limitation of this investigation is that in the calculation of the results of the models the only variables considered are geographical location of the points of sale and the distance travelled by buyers. In Lozano-Botache's (2016) words "a model is only a representation of reality explained geometrically and with mathematical support, which can result in true economic terms within the ceteris paribus framework" (p. 692). This decision was taken by the researchers to assess the influence of the location of every point of sale in a commercial network and their access to minimum potential geographic markets. Thus, for future works, we suggest study of the effect of other variables such as brand image, price, manufacturer advertising investment or advertising at the point of sale. Other variables may be the effect of the type of vehicle (product), since it has been considered to have the same degree of acceptance throughout the study area. Lack of information regarding the internal costs of each point of sale opens a new line of research. The second limitation comes from the investigation period. As has been indicated, the study interval 2007-2011 allowed us to Geographical information systems obtain and analyse results in an economic context of special interest. It is recognized that the data become outdated quickly and, therefore, it is recommended that the study be replicated in the future. Another limitation has been the restriction on access to registration information (vehicle sales), since the Organic Law on Data Protection does not allow the dissemination of personal information that may lead to the identification of the individual (or a specific vehicle). Therefore, the postal code of the buyer is the highest level of detail for the registration data. Future work could introduce the influence of gender or the age of the vehicle buyer. Another aspect to be considered in the interpretation of the results is that this research has been carried out in a specific area and has been limited to the movements within it. It is possible that the behaviours are different in other autonomous communities or other countries.

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How does confirmation of motivations influence on the pre- and post-visit change of image of a destination?

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Abstract

Purpose – The purpose of this paper is to analyse the influence of the confirmation of the motivations of tourists in changing image of a tourist destination pre- and post-visit. That is, considering whether once the tourist has made the trip, depending on whether their expectations have been met and confirmed motivations, will have a more or less image gap.

Design/methodology/approach – The authors conducted an empirical study with a representative sample of leisure tourists to Tenerife (Canary Islands, Spain) of both sexes, 16 or more years of age, and visiting the island of Tenerife for the first time from abroad and from the rest of Spain. The final sample was 411 participants.

Findings – The results verify that the confirmation of the intellectual and escape motivations influences directly and positively change cognitive image pre- and post-visit. The fact that the affiliation motivations do not influence the cognitive image gap may be due to that tourists who visit a destination stay with friends or family and for this they interact less with the destination, which will imply that the cognitive image pre- and post-visit do not vary.

post-visit do not vary. **Originality/value** – This research has sought to contribute towards a better understanding of the area, which is concerned, with the image of destinations and, more specifically, the concept of how the image changes after a visit to the destination. In this sense, and given the of lack empirical evidence about how confirmation of motivations influences on destination image gap, this research aims to contribute to the improvement of knowledge about the personal factors that influence the change of the pre- and post-visit destination image.

Keywords Tourism marketing, Tourist motivations, Image of tourist destinations Paper type Research paper

Introduction

From an academic point of view, tourism has aroused great interest and has been the subject of a great deal of research that has contributed to a greater knowledge of the mechanisms that regulate supply and demand in tourism. The marketing literature highlights the importance of the image of tourist destinations as an object of study, as it represents one of the key factors affecting the consumer in all phases of consumption of the tourism product (Kim *et al.*, 2009; Yilmaz *et al.*, 2009; Nicoletta and Servidio, 2012). In this sense, Giraldi and Cesareo (2014) demonstrate the existence of significant differences in the dimensions of the cognitive image and in the affective image of a destination among the tourists who visit a destination for the first time, as well as repeat visitors (repeaters).

The importance of the image as an element that influences the behaviour of the tourist has been treated in the literature, basically, with respect to the "choosing a holiday" phase

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European Journal of Management and Business Economics Vol. 26 No. 2, 2017 pp. 238-251 Emerald Publishing Limited 2444-8451 DOI 10.1108/EJMBE-07-2017-014 (Pike and Rvan, 2004; Hyde, 2008). Only recently have studies emerged that have attempted to deepen the understanding of the influence of the perceived image of destinations on consumer behaviour during the different phases of the travel process (before, during, and after). In this sense, some authors agree that there is a scarcity of studies on the evolution of the image during the different phases of the trip: before, during, and after the visit (Kim et al., 2009; Yilmaz et al., 2009), in spite of the importance for tour operators of knowing the differences between the image held prior to the trip and that which is held subsequently. It would also be effective in determining which factors can influence the differences between the pre- and post-image of a destination in order to be able to act on them and make them the focus of interventions. In short, although there is a multiplicity of works on the image of tourist destinations and numerous studies have defined a theoretical framework, there is still a lack of research that empirically verifies the factors that can influence the gap in the image that occurs before and after the visit (Young, 1999; Tasci and Gartner, 2007). Although the study by Tasci and Gartner (2007) has made it possible to construct a model of the complex relationships connected to the evolution of the image of a tourist destination, many of them still have to be empirically contrasted. For these authors, it is important to study the antecedents of image formation. taking into account the possibility that there is a gap between the pre-visit and post-visit image. resulting in all the factors that have influenced the confirmation of both constructs.

From a conceptual point of view, there is general agreement (Baloglu and Brinberg, 1997; Walmsley and Young, 1998; Baloglu and McCleary, 1999a, b; Baloglu and Mangaloglu, 2001; Chen and Uysal, 2002; Beerli and Martín, 2004a, b; Pike and Ryan, 2004; Hosany *et al.*, 2006; Pike, 2009) in considering the image as the result of three components that are closely interrelated: perceptual/cognitive, which relates to the beliefs of individuals about the attributes that characterise a tourist destination; affective, which refers to the emotional response or feelings that individuals express about a place; and, global, which corresponds to the overall impression, positive or negative, of the place. In addition, the cognitive component is an antecedent of the affective, since the emotions are also influenced by rational elements, and the cognitive component directly influences the global image of a destination, as well as indirectly through the contribution of the affective component (Holbrook, 1978; Russel and Pratt, 1980; Anand *et al.*, 1988; Stern and Krakover, 1993; Beerli and Martín, 2004a, b).

The image of a destination evolves from a focus on the place and its cognitive components to an approach based on the experience of the destination, to arrive, in the end, at a complex image formed after the visit (Mackay and Mcvetty, 2002; Lee, Kang, Reisinger and Kim, 2012). As Lee, Kang, Reisinger and Kim (2012) affirm, the process of image change gives rise to different results in terms of incongruities: positive when the post-visit image is better than the pre-visit one, or negative when the image after the trip is less favourable than the image before travel. The incongruity between the pre- and post-visit image influences the tourist experience, satisfaction, and post-trip behaviour. For these authors, it is necessary to delve into the intrinsic factors that cause the change that occurs between pre- and post-visit image. In fact, variables such as the motivations that the tourist has before visiting a destination and the confirmation of those motivations after the visit can influence the change of image before and after the visit to the destination. The lack of empirical work that analyses how the confirmation of the motivations of tourists influences the gap in the image of a destination pre- and post-visit has led us to propose the present investigation, which aims to analyse the degree to which the confirmation of motivations, once the trip is realised, can influence how the image has changed after the visit. To this end, we aim to contribute to a better understanding of the factors intrinsic to the tourist that influence the change in the image of a tourist destination.

Revision of literature

In general, people travel to particular destinations because these destinations satisfy a series of desires, such as escape from the daily routine, relaxation, and the opportunity to spend

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quality time with family or friends. These decisions, in turn, are stimulated and reinforced by the attributes of the chosen destination, such as beaches, cultural attractions, shopping facilities, and other attractions (Lee, Guillet, Law and Leung, 2012). From this perspective, these same authors point out that different motivations are associated with different destinations, demonstrating the link between motivations and the image of a destination. In this context, numerous studies have shown that motivations are personal factors that influence the potential tourist's perception of image during the pre-visit phase – that is, during the process of choosing a tourist destination. (Beerli and Martín, 2004a, b; Gursoy and McCleary, 2004; Hyde, 2008).

Motivation – understood as a state of necessity that pushes the individual to act in a certain way that is assumed will lead to a desirable sense of satisfaction – is a key personal factor in reducing travel alternatives and in choosing a potentially rewarding destination. It is, therefore, an internal mechanism that leads individuals to act in a concrete way in order to satisfy their desires and needs (Nicoletta and Servidio, 2012), which is to say, their reason for taking the trip. According to Yoon and Uysal (2005), motivation plays a determining role in many phases of the behavioural process of the tourist, since it is an element that drives the search for new information (Pike and Ryan, 2004), a filter for the projected image and the criterion for the choice of destination (Um and Crompton, 1990), and an element of differentiation among tourists visiting the destination for the first time, as well as repeaters, with particular reference to familiarity as opposed to novelty (Hu and Ritchie, 1993; Kaplanidou, 2007).

The main role attributed to motivation is that it is a personal factor that influences the formation of the image before and during the visit (Beerli and Martín, 2004a). However, there are different theories for understanding motivations, such as Maslow's hierarchy of needs, Plog's allocentric-psychocentric typology, expectation-value theories, and the push-pull paradigm, the latter being the one that enjoys greater acceptance in the literature – although it is often criticised for being an excessively orthodox approach to understanding motivations (Chen and Chen, 2015; Prayag and Hosany, 2014). According to Goossens (2000), motivations are related to the needs or objectives of individuals ("push" factors). In addition, there are marketing stimuli ("pull" factors) that allow the consumer to gain knowledge relating to the attributes that characterise the tourist destination and can modify the reason for taking the trip, or provide new motivations. In particular, push factors are internally generated drivers that instil in the tourist the need to look for signs in objects, situations, or events in order to reduce uncertainty; while pull factors are generated externally and help to gain a better understanding of the attributes of a destination, reinforcing motivations or "push" factors (Gnoth, 1997). In this context, and by way of summary, Lee, Guillet, Law and Leung (2012) point out that pull factors are related to external and cognitive aspects of a destination (beaches, cultural attractions, etc.), while push factors are related to the internal and emotional aspects of the trip (rest, relaxation, adventure, etc.). In this sense, push factors are those that propel an individual to travel to a destination in order to meet his or her own needs, and pull factors - or extrinsic motivations - are those attributes of a destination that push individuals towards choosing of a particular place (Seebaluck *et al.*, 2015).

According to Chon (1989), pull factors represent the elements of attraction of a place and can be classified into three categories: static factors, i.e., natural environment, climate, and historical/cultural attractions; dynamic factors, including hotels, services, sport, leisure activities, and political conditions, and current decision-making factors, i.e., marketing, prices in the country or region of origin in comparison with prices at the destination, etc.

The model proposed by Lubbe (1998) shows how the "push" and "pull" factors act in concert to generate the individual's motivation to travel, transforming him or her into a potential tourist. The moment the potential tourist selects a destination as a possible choice for a holiday, they have already constructed the initial image of the destination in their mind. In addition, the author distinguishes three orders of preference that the potential tourist can attribute to push and pull factors and which give rise to three categories of tourists: potential tourists who act more in consideration of their needs ("push" factors),

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potential tourists who have needs that can be satisfied only by specific destinations and, therefore, give more importance to pull factors, and potential tourists who can be impelled equally by "push" and "pull" factors (e.g. potential tourists who have their annual departure plan during which they would consider travelling to any destination). According to Lubbe (1998), the motivation during the pre-visit phase encourages the potential tourist to make a choice and to realise the trip based on the image they have prior to travel.

Wang *et al.* (2016) indicate that most theoretical and empirical studies suggest that motivations are a precursor to the image of a destination. However, most of them have shown that motivation influences only the affective component of the image (Dann, 1996; Baloglu, 1997; Beerli and Martín, 2004a, b; San Martin and Rodríguez Del Bosque, 2008). However, other studies have shown that there is also a direct relationship between the motivation and the cognitive component of the image (Hernández-Lobato *et al.*, 2006; Li *et al.*, 2010; Wang *et al.*, 2016). Even works such as Sancho and Álvarez (2010) conclude that socio-psychological motivations (physical, cultural, interpersonal, social, and prestige, and resulting from experiences prior to arrival at the destination) directly influence the cognitive component of image, but not the affective component.

In a study by Li *et al.* (2010), the relationship between motivation, the image of a tourist destination, and post-travel behaviour was analysed. These authors classify motivations into three categories: "intellectual", connected, for example, with the desire to know the history of the country, to experience different cultures and lifestyles at the destination, to discover the natural environment, to increase knowledge of a place, people, things, etc.; "affiliation", connected with the desire to visit friends and relatives, spending time with the family away from home, doing things with the whole family, qualitatively improving the time they spend with their children, etc.; and "escape", connected with the desire to get away from the daily routines of life, to experience adventures, exciting circumstances and fun situations, and to relax and to have time to recuperate from work and daily life. According to these authors, there is no direct relationship between motivations and intention to revisit a place, since this relationship is influenced by the image of the tourist destination. The authors show that the different motivations that drive travel have a direct effect on the image of the tourist destination and an indirect one on the intention to repeat a visit. This is because if the image of the destination during the trip does not satisfy the motivations that have induced the tourist to travel, it generates a global dissatisfaction that results in failure to return to the destination in the future (Li et al., 2010). In other words, the authors empirically demonstrate that "intellectual" and "affiliation" motivations have a positive influence on the cognitive dimension of the image; while only the "escape" motivation has a positive impact on the affective component of the image.

Under this framework, the present work aims to evaluate whether these motivations have effects on the gap formation between the pre- and post-visit image. In this sense, we seek to assess if once the tourist has made the trip, depending on whether his expectations have been met and his motivations confirmed, they will have a post-visit image which is more or less distant from the pre-visit image, with a consequent generation of a greater or lesser gap. Moreover, since the theory shows that there is no agreement in the literature about which components of the image are influenced by motivations, our analysis can contribute towards clarifying this debate.

In summary, and with the ultimate aim of evaluating the effects of the confirmation of motivations on the gap between the components of the pre- and post-visit image, we propose the following hypotheses:

H1a. Confirmation of the motivations of tourists affects the gap between the cognitive image, pre- and post-visit.

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- *H1b.* Confirmation of the motivations of tourists affects the gap between the affective image, pre- and post-visit.
- *H1c.* Confirmation of the motivations of tourists affects the gap between the global image, pre- and post-visit.

Additionally, and according to the doctrinal revision, the model also gathers the interrelations between the cognitive, affective, and global image, in a way that shows that the cognitive image directly influences the affective and global image, and indirectly the global image, through the affective image, which also directly influences the global image (see Figure 1).

Methodology

The study population in the present research focusses on leisure tourists in Tenerife, the unit of analysis being tourists of both sexes, 16 years and older, who are visiting the island for the first time from abroad or from the elsewhere in Spain.

The sample size amounted to 411 tourists, the assumed error being, therefore, ± 4.93 per cent for a 95% confidence interval. For the selection of the sample, a method of empirical selection was followed by the quotas related to the nationality, sex, and age dimensions, with affixation proportional to the number of tourists in each of the established dimensions. The field work was carried out during the months of June and July 2015 at the most popular tourist attractions in Tenerife frequented by travellers: Las Américas, Los Cristianos, Costa Adeje, El Médano, Candelaria, Puerto de la Cruz, Garachico, and Los Gigantes. The profile of the respondents was similar to that of the population. There are almost as many women (54 per cent) as men (46 per cent). Most respondents ranged from 25 to 44 years (45.40 per cent) or between 45 and 64 years (30.50 per cent), followed by those 24 years and younger (11.20 per cent) and 65 and over (12.90 per cent). With regard to the country of origin, the majority come from the UK (37.37 per cent), Germany (14.41 per cent), Spain (12.60 per cent). Nordic countries (10.34 per cent), the Netherlands (7.06 per cent), and others (18.22 per cent).

In relation to the measurement scales, a Likert scale of eight items and seven points was used to measure the motivations of the tourists based on the scale proposed by Li *et al.* (2010). With this scale, we assessed the degree of confirmation for each motivation once the trip was realised. In order to measure the cognitive, affective, and global image gap, the works of Beerli and Martin (2004a, b) were referenced, using a Likert scale of seven points and ten items to measure the cognitive image, two items to measure the affective image, and one item to measure the global image. The items on the scale of the cognitive image are listed in Table I. The two items on the scale of the affective image are "pleasant place" and "fun place". This affective image scale obtained a reliability, measured through Cronbach's α , of 0.7. To assess the gap, the respondent assessed the degree to which each



Figure 1. Influence model of the confirmation of motivations in the image gap

| Dimensions | Item code | Items | Confirmation of motivations |
|----------------------------------|-----------------------|--|---|
| Natural and artificial resources | COG1 COG2 COG3 | Climate Natural resources (countryside, national parks, flora and fauna, etc.) Tourism infrastructure (accommodation, restaurants, shopping centres, ref courses, etc.) | |
| | COG4 | General infrastructure (highways, airports, public transport, sanitation, internet, etc.) | 243 |
| Tourism activities | COG5 COG6 | Leisure activities and recreation (theme parks, tourist activities, golf, wellness centres, etc.) Nightlife (hars, night clubs, casinos, etc.) | |
| | COG7 | Adventure sports (paragliding, rafting, etc.) | Table I |
| Environment | COG8 COG9 COG10 | Sporting activities (sailing, windsurfing, cycling, etc.) Environment (cleanliness, clean air, etc.) Security | Definite items of the destination attribute scale |

item in the cognitive, affective, and global image had been better, equal to, or worse than expected, according to the information that was obtained before the trip on a scale ranging from -3 to +3, where -3 is much worse than expected, 0 is equal to expected, and +3 is much better than expected.

Results

Validation of measurement scales

As a prior step to the validation of the scale that determines the gap of the pre- and post-visit image, a frequency of the items that conformed to this scale was made in order to analyse its distribution. All items were rated on a scale of -3 to +3, where -3 is much worse than expected, 0 is equal to expected, and +3 much better than expected. The results reflect that the percentage of negative gap (-3 to -1) is very small in relation to all the attributes of the destination (less than 5 per cent), as well as in the items of the affective image gap scale and the gap of the global image. Due to this, and for all items, the values of -3, -2, -1 and 0 were recoded into a single category, which has been labelled "Same as expected or slightly worse". In this way, the items of the cognitive, affective, and global image gap are taken as possible values 0, +1, +2 and +3.

The final results of the second-order confirmatory factor analysis applied to the recoded scale of four states of the cognitive image gap of the destination determined three dimensions, which have been labelled as "Natural and Artificial Resources" (RESNATART), "Tourism Activities" (ACTIVTOUR) and "Environment" (ENVIRONMENT). To analyse the dimensionality of this scale, a new model was estimated in which all items are linked to a single factor. The results of this new model ($\chi^2(35) = 343.02$, p = 0.000, CFI = 0.76, RMSEA = 0.15) demonstrate the suitability of a multidimensional model ($\chi^2(32) = 140.75$, p = 0.000, CFI = 0.92, RMSEA = 0.09), since it presents higher levels of significance and adjustment indexes. In fact, the analysis of χ^2 differences reveals significant differences (Dif. $\chi^2 = 202.27$, Dif. g.d.l. = 3, p = 0.000). Therefore, this scale of the destination attribute gap has finally been formed by three dimensions and by the items shown in Table I. The items removed from the original scale showed low standardised estimators and their significance was gleaned from other items of the scale.

Although the results of this measurement model indicate that it is statistically significant $(\chi^2(32) = 140.75, p = 0.000)$, it should be noted that this statistic depends on the size of the sample analysed, hence the need to analyse other adjustment indicators. In this respect, the results obtained show that other indicators of global fit of the model are within the values recommended by the literature (CFI = 0.92, NFI = 0.89, TLI = 0.88, RMSEA = 0.09).

For this reason, we can conclude that the specified model accurately reproduces the observed covariance matrix. This measurement model shows an adequate fit, since the CFI value is higher than 0.90, although the RMSEA value is at 0.09 (Mathieu and Taylor, 2006). Following Anderson and Gerbing (1988), and as shown in Table II, the model shows acceptable individual reliability, since the relationship between each item and its respective dimension is statistically significant with higher than, or very close to, standardised regression weights in their majority at 0.7, and with values of the statistic t also significant. As for the measures of internal consistency, the values of the composite reliability (CR) of the gap dimensions of the cognitive image reach values higher than, or close to, 0.70, and those of the extracted variance (AVE) higher than, or close to, 0.50. Cronbach's α values corroborate those obtained in CR (see Table II). It can be affirmed, therefore, that the scale of the cognitive image gap is a construct of a multidimensional nature formed by three dimensions, which show discriminant validity, since the AVE of each one of the dimensions is superior to the square of its correlation with the remaining dimensions. These results indicate that the measurement model can be considered valid, although it would be advisable to replicate it in other contexts and even to extend or modify the content of some of the dimensions in order to raise its level of reliability.

With respect to the confirmation scale of the motivations, the final results of the confirmatory factor analysis show the existence of the three types of motivations proposed by Li *et al.* (2010), which have been labelled as "Intellectual or knowledge motivations" (INTMOT), "Escape motivations" (ESCMOT), and "Affiliation or social motivations" (AFILMOT). However, to analyse the dimensionality of this scale, we also estimated a new model in which all items are linked to a single factor. The results of this new model ($\chi^2(20) = 467.85$, p = 0.000, CFI = 0.65, RMSEA = 0.23) demonstrate the suitability of a multidimensional model ($\chi^2(17) = 69.48$, p = 0.000, CFI = 0.96, RMSEA = 0.08), as it presents higher levels of significance and better adjustment indexes. In fact, the analysis of χ^2 differences reveals the existence of significant differences (Dif. $\chi^2 = 398.37$, Dif. g.d.l. = 3, p = 0.000). Therefore, this confirmation scale of travel motivations has finally been formed by the dimensions and items shown in Table III. The items removed from the original scale showed low standardised estimators and their significance was gleaned from other items of the scale.

Although the results of this measurement model indicate that it is statistically significant ($\chi^2(17) = 69.48, p = 0.000$), as we have already noted, this statistic depends on the size of the sample analysed, hence the need to analyse other adjustment indicators. In this respect, the

| Relaciones causales | Estimadores estandarizados | t | Þ | Consistencia interna |
|------------------------|----------------------------|--------|-------|----------------------|
| | 0.958 | | | FC = 0.818 |
| ACTIVTOUR←GAPCOGIMAG | 0.614 | 5.704 | 0.000 | AVE = 0.607 |
| ENVIRONMENT←GAPCOGIMAG | 0.726 | 6.009 | 0.000 | $\alpha = 0.699$ |
| COG1←RESNATART | 0.536 | | | FC = 0.726 |
| COG2←RESNATART | 0.672 | 8.877 | 0.000 | AVE = 0.401 |
| COG3←RESNATART | 0.660 | 8.803 | 0.000 | $\alpha = 0.723$ |
| COG4←RESNATART | 0.655 | 8.769 | 0.000 | |
| COG5←ACTIVTOUR | 0.604 | 9.712 | 0.000 | FC = 0.811 |
| COG6←ACTIVTOUR | 0.591 | | | AVE = 0.523 |
| COG7←ACTIVTOUR | 0.824 | 11.774 | 0.000 | $\alpha = 0.802$ |
| COG8←ACTIVTOUR | 0.837 | 11.832 | 0.000 | |
| COG9←ENVIRONMENT | 0.728 | | | FC = 0.643 |
| COG10←ENVIRONMENT | 0.648 | 8.257 | 0.000 | AVE = 0.475 |
| | | | | $\alpha = 0.641$ |

Table II. Confirmatory factoria analysis of the cognitive image gap scale

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results show that other indicators of global fit of the model are among the values recommended by the literature (CFI=0.96, NFI=0.95, TLI=0.93, RMSEA=0.08). Therefore, we can conclude that the model correctly reproduces the observed covariance matrix. This measurement model shows a very satisfactory adjustment since the value of CFI is higher than 0.95 and the value of RMSEA does not exceed the recommended maximum of 0.08 (Mathieu and Taylor, 2006). Following Anderson and Gerbing (1988), and as shown in Table IV, the model shows an acceptable individual reliability, since the relationship between each item and its respective dimension is statistically significant, presenting statistically significant t values, albeit with standardised regression weights which are not quite satisfactory, with two of them not exceeding the value of 0.7. As for the internal consistency measures of each of the motivation typologies, the values of the CR indicator reach values higher than, or very close to, 0.70, although one of the variances extracted (AVE) does not exceed 0.50 - though it is very close (0.445). The values of Cronbach's α corroborate those obtained in the CR. In addition, the three dimensions of the scale of motivations show discriminant validity, since the AVE of each of the dimensions is superior to the square of its correlation with the other dimensions. Therefore, these results indicate that the measurement model can be considered as valid, although, as in the previous case, it would be advisable to replicate it in other contexts and even extend or modify the content of some of the dimensions in order to raise its level of reliability.

Influence of the confirmation of the motivations on the gap in the pre- and post-visit image of the destination

Before proceeding to the contrast of the hypotheses, a new variable has been created for each one of the dimensions of the cognitive and affective image gap, as well as for the motivations, through the weighted average of the scores given by the respondents to the items that make up each dimension, weighted by the regression weights of each of them in the previous AFC. These variables have been labelled with the same name given

| Dimensions | Item code | Items | |
|---------------------------------------|----------------------|---|--|
| Intellectual or knowledge motivations | MOT1 MOT2 | Get to know different cultures and lifestyles Increase knowledge of other places, people, or things | |
| Escape motivations | MOT3 MOT4 MOT5 | Escape from the daily routine Seek adventure and participate in exciting activities | |
| Affiliation or social motivations | MOT6 MOT7 MOT8 | Visit friends and relatives Spend time with family away from home See and do new things with the family | Table III. Definitive items of the trip motivation confirmation scale |

| Causal relationships | Standardised estimators | t | Þ | Internal consistency | |
|----------------------|-------------------------|--------|-------|---------------------------|------------------------|
| MOT1←INTMOT | 0.763 | | | FC = 0.727 AVE = 0.572 | |
| MOT2←INTMOT | 0.749 | 8.349 | 0.000 | $\alpha = 0.724$ | |
| MOT3←ESCMOT | 0.464 | | | FC = 0.698 | |
| MOT4←ESCMOT | 0.767 | 7.624 | 0.000 | AVE $= 0.445$ | Table IV |
| MOT5←ESCMOT | 0.729 | 7.670 | 0.000 | $\alpha = 0.718$ | Confirmatory factorial |
| MOT6←AFILMOT | 0.492 | 10.489 | 0.000 | FC = 0.853 | analysis of the scale |
| MOT7←AFILMOT | 0.901 | 21.574 | 0.000 | AVE = 0.675 | of confirmation of |
| MOT8←AFILMOT | 0.986 | | | $\alpha = 0.822$ | motivations |

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to the dimensions. On the other hand, to contrast *H1a-H1c*, a model of structural equations for each of the three typologies of motivations (intellectual, escape, and affiliation) has been made, since the empirical evidence in this respect establishes conclusions in function of the type of motivation and, in addition, the sample size is not high enough to fit a single model. Moreover, if one wanted to adjust a single model, one would have to opt for a model path with the consequent loss of information that would entail.

Figure 1 shows the adjustments of the three models, which can be considered as acceptable. From the results obtained, it is clear, first, that the confirmation of the "intellectual" and "escape" motivations directly and positively influence the cognitive image gap, unlike with the confirmation of the "affiliation" motivation; second, that the affective image gap is not influenced by the confirmation of motivations in any of the three typologies; and, third, that the gap in the global image is directly and negatively influenced only by the confirmation of the "escape" motivation to a level of significance of 1.7 per cent. The lack of a statistically significant relationship between the confirmation of motivations relating to the affective image gap in two cases and the global one in all three cases may be due to the fact that the cognitive image gap has a strong influence on the affective image gap, and the latter on the global image gap, generating only indirect confirmation of motivations effects on the gap in the affective and global image. In the literature, there is some controversy in this regard, since there are studies in which the relationship between motivations and affective image is not confirmed (Sancho and Alvarez, 2010; Wang et al., 2016) Most studies have not contrasted the relationship between motivations and the global image. Therefore, these results allow us to accept H1a, and partially H1c, but lead us to reject H1b. On the other hand, it is worth noting that having adjusted the model for each of the different types of motivation implies a greater robustness to the results, since it is possible to analyse the stability, or otherwise, of the results (Figure 2).

Discussion, conclusions, and implications

In the empirical analysis developed in line with the theoretical model, we have attempted to analyse the effects on the image gap of factors closely connected to the personal sphere of the individuals, and that refer to the confirmation of the possible motivations for travel to the destination. The added value of this work in these aspects is, on the one hand, in the consideration of the confirmation of motivations as an antecedent and not in the motivations themselves, as is usual in the empirical work collected in literature; and, on the other hand, the consideration in this relationship of the pre- and post-visit change of image in its three components.

The results indicate that with the confirmation of the three types of motivation (intellectual, escape, and affiliation) analysed individually, only the first two types influence directly and positively the cognitive image gap. This result is in line with the revised literature, establishing that the tourists who satisfy their reason for the trip during the visit will have an image of the destination after the experience that is better than the one they had initially, generating a positive cognitive image gap. The fact that the "affiliation" motivation does not influence the cognitive image could be due to the fact that tourists who visit a destination to visit friends or to be with the family interact less with the destination, which means that the pre- and post-visit cognitive image may not vary. We do not reach the same conclusion if we consider the effect of the confirmation of motivations on the gap in the affective and global image, since there is no significant relationship between the confirmation of motivations and the gap of these components of the image, with the exception of the confirmation of the "escape" motivation, which does present a statistically significant relationship with the global image gap. Nevertheless, there is an indirect influence of the confirmation of the different motivations on the gap in the affective and global image through the gap in the cognitive image; and the fact that the relationship between the gap in the

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Notes: *** $p \le 0.001$; ** $p \le 0.01$; * $p \le 0.05$

cognitive and affective image is so strong as to justify the one that absorbs the indirect effects and cancels the direct ones. With regard to the direct and negative effect of the confirmation of the "escape" motivation on the gap in the global image, this could be consequence of the destination chosen to be the object of analysis not being characterised as being an "adventure" destination, although some leisure activities related to adventure can be found; this has repercussions on that the global image post-visit, which does not improve with respect to the image that was had before the visit to the destination took place – although a perceptible improvement in the cognitive image does occur. On the other hand, the fact that the cognitive image gap does not directly influence the global image gap, as one might expect, may be a consequence of the indirect effect which occurs through the affective image gap, since the relationship between the cognitive image gap and the affective image gap is so strong that it cancels the direct effect between the cognitive and global image gap.

This research has sought to contribute to a greater knowledge in the field of tourist destination image and, more specifically, about the concept of image change after a destination is visited, as a consequence of the confirmation of the motivations of tourists.

From an academic point of view, an attempt has been made to continue advancing the development of the topic in order to better understand how the confirmation of the different motivations of the tourists influences the gap in the pre- and post-visit image. More specifically, and based on a conceptual structure of image with theoretical support, it has been verified that the image of the tourist destination can be subject to change before and after the visit in function of the confirmation of the motivations of the tourists. Additionally, we have analysed the psychometric properties of the scales used, the analysis of which could prove useful for subsequent studies.

From a practical point of view, a better understanding of the motivations of tourists which influence the pre- and post-visit change in image will help operators from the sector and the public institutions responsible for the commercial management of the destinations to project an image that is as close to reality as possible and to meet the various needs of tourists. Based on the results of the present investigation, it is essential that destinations satisfy the "intellectual" and "escape" motivations of tourists so that the image they take back is better than expected. Therefore, the promotion of destinations must be based on a positioning that attracts tourists whose motivations are in line with what the destination offers. Conversely, when tourists travel to a destination on the grounds of "affiliation", there is no positive change in the destination's image before and after a visit to it. This may be a consequence of tourists spending more time with friends and family and less time interacting with the destination through visiting places of interest.

Although we have attempted to carry out the research following criteria of scientific rigour with the objective of providing empirical evidence that contributes to a greater knowledge and understanding of the process which forms the image gap in tourist destinations, we are aware of its limitations, both conceptual and methodological. From a conceptual point of view, the research is limited to the context of its own objectives and we are aware that there are other personal factors that can also affect the process of image change, such as the psychographic profile of tourists, which is not included in our research (personality, values, lifestyles, etc.). In addition, it would be interesting to extend the analysis to repeat tourists in order to discover the effect of prior knowledge and familiarity with a place on the image gap. Similarly, the role that culture plays on the formation of the gap could be the subject of further work. From a methodological perspective, this work, like any other empirical research, presents limitations that affect the evaluation and generalisation of its results. In structural models, causality must be understood in terms of statistical association and not under the conditions of an experimental design. However, we have tried to propose causal relations supported theoretically on the basis of the theoretical foundations raised in the section of literature review. Finally, the generalisation of the results constitute another limitation, since the scope of the investigation only generalises the results of the analysis to the population on which the sample is based and the tourist destination of Tenerife. It would, therefore, be advisable to replicate this research in other contexts and to analyse the factors that influence the perceived image in other tourist destinations.

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The contribution of tangible and intangible resources, and capabilities to a firm's profitability and market performance

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Abstract

Purpose – The purpose of this paper is to investigate the relative contribution of tangible resource (TR) and intangible resource (IR), and capabilities on firm performance based on the measures of market share, sales turnover and profitability.

Design/methodology/approach – A cross-sectional survey research design was used in the study. The modified version of Galbreath and Galvin's (2008) resource-performance questionnaire which included a total number of 45 questions was applied on 243 Turkish firms operating in different industries. The data collected were analysed by hierarchical regression analysis.

Findings – The findings revealed that IRs and capabilities contributed more greatly to firm performance compared to TRs. However, in contrast to the proposition of resource-based theory that views capabilities as the most important skills that underpin the development and deployment of both TR and IR, capabilities offered rather limited additional explanatory power to the prediction of firm performance only with respect to profitability against the combined effects of TR and IR.

Originality/value – The vast majority of the empirical resource-based view (RBV) research concentrates on developed countries and very little is known about results outside of this domain. This study employs Turkish business databases to assess the relative importance of TR and IR and capabilities on performance differences among firms in Turkey which was the 17th largest economy in the world trade in 2016. Second, in the RBV literature, limited research tests the contribution of capabilities to firm success after simultaneously accounting for the effects of other resources (namely, TR and IR) available to the firm. Finally, this research offers practical contributions to executives and managers who have to make adequate decisions for firm survival and growth in the competitive business arena.

Keywords Firm performance, Emerging markets, Capabilities, Resource-based view,

Tangible and intangible resources

Paper type Research paper

1. Introduction

Strategy researchers (Ambrosini and Bowman, 2009; Kor and Mesko, 2013; Molloy and Barney, 2015) have suggested that intangible resources (IRs) were considered as the most likely sources of firm success because they are not easily acquired and replicated in factor markets. However, since firms are bundles of IR and tangible resource (TR), it is very unlikely for a firm to compete on the basis of a single IR, important as it may be (Sirmon *et al.*, 2011; Kor and Mesko, 2013). Moreover, since TR and IR are static in nature (Teece, 2007; Helfat and Peteraf, 2015),

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European Journal of Management and Business Economics Vol. 28 No. 2, 2017 pp. 252-275 Emerald Publishing Limited 2444-8451 DOI 10.1108/EJMBE-07-2017-015 organisations must use some other mechanisms that can integrate and reconfigure resources, and renew or alter their resource mix to be able to cope with environmental changes. Several researchers (Weigelt, 2013; Wang *et al.*, 2015) suggest that only the capabilities can turn these static resources into dynamic nature and transform them to create a new configuration of resources that can sustain competitive advantage. Therefore, over the last quarter century, a large body of strategic management research which includes theoretical and empirical studies has worked on the understanding of how firms' different sets of resources and capabilities lead to performance variations among firms (Molloy and Barney, 2015; Morris *et al.*, 2017).

Nevertheless, against the main prescription of resource-based view (henceforth known as the RBV) which points IRs as the most likely sources of competitive advantage and theorises that TRs offer no or very limited contribution to overall firm performance, little empirical evidence within the RBV stream exists to falsify the claim (Galbreath and Galvin, 2008; Renzi and Simone, 2011; Schriber, 2015). To be able to test the truthiness of this claim, TR and IR should be used together in the same analysis. Moreover, resources are not productive on their own and it is the capabilities that assemble, integrate and manage the bundles of resources (Teece, 2007; Maritan and Peteraf, 2011).

Huselid (1995) states that "one-dimensional studies are likely to underestimate the biases associated with examining an individual resource as such studies do not simultaneously account for the effects of other factors" (p. 642). Similarly, Galbreath and Galvin (2006, p. 151) highlight that "studying an individual IR (e.g. reputation, brand) apart from other factors might offer misleading results". Hence, any research that aims to test the effects of resources on firm performance should include capabilities as well as TR and IR in the analysis. However, only a few RBV studies (e.g. Fahy, 2002; Galbreath and Galvin, 2008; Schriber, 2015) have examined the relative effects of TR and IR on firm success in the same study and the justification of these studies is compelling particularly for validation of the main prescription of the RBV (Makhija, 2003; Galbreath and Galvin, 2008; Schriber, 2015).

Although the main prescription of the RBV points to firm-level factors as the most important determinants of firm performance, it does not omit the industry effects completely (McGahan and Porter, 1997; Short *et al.*, 2009). According to Porter (1980), having analysed an industry in terms of its structural attractiveness, firms must choose a strategy in order to create a unique, defendable position in their industry. Then, the firm should acquire or otherwise obtain the necessary resources (tangible and intangible) to implement its stated strategy. This interaction between resources and industry structure variables should be considered in RBV studies to account simultaneously for the effects of every factor in explaining performance differences (Huselid, 1995; Morgan *et al.*, 2009).

In the context of the main prescription of the RBV and its theoretical framework, the question of relative effects of TR and IR along with the capabilities on firm success has always remained an important issue to be answered. Thus, the ultimate research question of this study is: what are the relative effects of TR and IR, and capabilities in explaining firm performance?

This study aims to make potential contributions to RBV in three main areas: first, the vast majority of the empirical RBV research concentrates on developed countries and very little is known about results outside of this domain (Cavusgil *et al.*, 2013). Kamal (2011, p. 21) states that "specific research into emerging markets is necessary since the unique characteristics of emerging economies may prove many of the findings in developed economy settings invalid in an emerging economy setting". In this context, this study employs Turkish business databases to assess the relative importance of TR and IR and capabilities on performance differences among firms in Turkey which was the 17th largest economy in the world trade in 2016 (IMF World Economic Outlook, 2017).

Second, in the RBV literature, limited research tests the contribution of capabilities to firm success after simultaneously accounting for the effects of other resources (namely, TR and IR)

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available to the firm (Galbreath and Galvin, 2006, 2008; Molina-Azorin, 2012). The exclusion of other potentially important resources and the use of only a single resource (or a capability) or a few resources to measure the resource – firm performance relationship, may lead to overestimating results and undermine the complexities of competitive advantage (Galbreath, 2004). Moreover, the RBV does not repudiate the influence of industry structure factors on firm performance completely (Porter, 1991; Peteraf and Barney, 2003). Hence, testing the significance of the IRs and capabilities against the effects of other resources and even industry structure factors with a different empirical approach cannot only offer a more stringent test of intangibles' contribution to firm performance than previous studies but it may also contribute to the verification of the RBV's main prescription.

Finally, management research should offer practical contributions to executives and managers who have to make adequate decisions for firm survival and growth in the competitive business arena. It should be noted that decisions about where investments should be placed have important implications for management practice. For example, if capabilities (e.g. human capital, networking capabilities and business processes) are the most important determinants of performance, then the firms need to focus and invest on their dynamic skills, if the situation is in favour of IRs (e.g. brand, corporate image and organisational culture), then attention should be paid to unique resource stocks. As such, this study seeks to help managers with respect to resource investment decisions by revealing the key determinants of firm success and their relative importance on performance.

This research thus focusses on testing the contribution of different resources on firm performance. In the first section, previous literature in relation to resource-based theory which investigates firm-level resource and capability effects on performance was examined and accordingly, a number of hypotheses were developed to be tested. Afterwards, the methods that were employed in the study for empirical testing purposes were explained and the results were presented. In the final section, within the context of Turkish business environment and sample data, the findings were discussed, managerial implications were provided and the limitations of research along with future research directions were highlighted.

2. Literature review

In the last 30 years, RBV have paid considerable attention to internal firm-level factors to explore unexplained variance in firm performance. Wernerfelt (1984) emphasised the internal workings of a firm but did not entirely dismiss industry structure effects, and further linked firm performance to the idiosyncratic and heterogeneous resources of the organisations and proposed that acquisition of these resources are critical for earning above normal returns. Wernerfelt (1984) described the firm as bundles of resources and argued that "resources and products are two sides of the same coin" (p. 171). Afterwards, Barney (1991) suggested that competitive advantage can only be generated and sustained by firm-level resources that are valuable (V), rare (R), inimitable (I) and non-substitutable (N) – the so-called VRIN criteria framework and claimed that only resources that are intangible in nature possess these criteria. Therefore, in considering the heterogeneity among firms in resources as fundamental in explaining why some firms outperform others, the RBV posits such a position (Barney, 1991).

2.1 IRs as the focal point of the RBV

The RBV scholars (Barney, 1991; Kor and Mesko, 2013) claim that IRs cannot be readily obtained in the factor markets and copied by competitors easily. Along with several researchers (Dierickx and Cool, 1989; Peteraf and Barney, 2003), Barney (1991) proposed that the sources of inimitability can be explained by three isolating mechanisms: historical uniqueness, causal ambiguity and social complexity. In addition to these mechanisms, time

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compression diseconomies and interconnectedness have been widely discussed in strategic management literature (Dierickx and Cool, 1989; Bharadwaj, 2000).

Historical uniqueness refers to "unique historical events such as a firm's founding, being taken over by a firm sometime in the past by legendary managers or owners, emergence of the unique, valuable organisational culture in the early stages of a firm's history, choice of facility location decisions which created distinctive location advantages in the following years and choice of market entrance decisions as a first mover, that determined the long-term performance of the firm" (Barney, 1991, p. 108). These unique historical conditions endowed firms with resources that cannot be controlled by rivals and that cannot be imitated.

Causal ambiguity refers to "the ambiguity surrounding the connection between a firm's resource portfolio and its performance" (Bharadwaj, 2000, p. 171). Barney (1991) suggests that causal ambiguity exists when the link between its resources and sustained competitive advantage is not understood by competing firms. In this situation, it is very difficult for imitating firms to duplicate a successful firm's strategies since they do not understand exactly what makes a firm successful. Social complexity can be found where resources are based on complex social phenomena (Barney, 1991, Eesley et al., 2014) and it significantly constraints the ability of other firms to imitate these resources. Socially complex resources such as interpersonal relations among managers, corporate reputation of a firm among customers and suppliers and organisational culture are imperfectly imitable because, although it may be possible for competitors to specify and replicate (or engineer) these resources, there is no guarantee that they can achieve similar valuable benefits since socially complex resources are not subject to direct and standard management (Barney, 1991). In a similar line, the elements of intellectual property assets such as copyrights, patents, registered designs and trademarks that provide legal protection to firms preserve the economic benefits of the firms from being eroded and cannot be duplicated by competitors (Chari and David, 2012; Grimpe and Hussinger, 2014). Unique organisational culture can be a great source of competitive advantage since it has strong roots with being different, more creative and innovative (Gupta et al., 2017). Through possession of complex and inimitable organisational culture which always supported its employees use their skills freely, Sony, Virgin and Apple became among the most innovative firms in global markets. Moreover, as an example of presenting how value creation ability has shifted from TR to IR, Apple has changed its business from selling hardware to selling design and emotions with its aesthetically pleasing products such as the candy-coloured iMac, the diminutive iPod Nano and the legendary iPhone and iPad.

Another mechanism time compression diseconomies which is related to "the observed tendency of the costs of resource accumulation to rise within a given time interval" (Lockett *et al.*, 2009, p. 15) has also been widely mentioned in the literature. According to Dierickx and Cool (1989, p. 1507), time compression diseconomies refers to "the time needed to develop resources through learning, experience, firm-specific knowledge or, trained proficiency in a skill". Dierickx and Cool (1989) argue that the inimitability of a resource is linked to the characteristics of the resource accumulation process. For example, organisational culture is such a unique IR that can be difficult for competitors to replicate since it possesses the conditions of asset specificity and time compression diseconomies (Dierickx and Cool, 1989; Lockett et al., 2009). Corporate reputation as an IR involving an external overall evaluation of firms' actions and past performance in creating stakeholder value (Dowling, 2016) can be accrued in the minds of stakeholders over time. Research (i.e. Wei et al., 2017; Raithel and Schwaiger, 2015) found that because of its unique and complex nature, favourable corporate reputation was linked to firm performance and helped firms sustain competitive advantage in the markets. Similarly, sophisticated in-secret technology for the manufacturing firms (or service know-how for the services firms) Contribution of TR and IR

may also become a socially complex and causally ambiguous resource over time. A similar and good example to the creation of competitive advantage through this kind of an in-secret technology ownership is "the cross-docking system of retail giant Wal-Mart" (Galbreath, 2004, p. 121). In the early years of Wal-Mart, whilst supply chain software of the firm contained commodity-type of information technologies that can be obtained easily in the factor markets, the system underwent such a complex customisation over years that none of the competitors could afford to imitate it. In a more recent study, Arend *et al.* (2014) who point knowledge as the most strategically important firm resource found that socially complex embedded internal knowledge were significantly correlated on firms' survival, return on asset (ROA), and Tobin's q of firms.

Interconnectedness which was discussed by Dierickx and Cool (1989) refers to "the value of a resource being inexplicably linked to the presence of another complementary or co-specialised resource" (Bharadwaj, 2000, p. 171). Lockett *et al.* (2009) explain resource interconnectedness as the link between the existing stock of resources and the cost of adding an increment of another resource to the firm's stock. The closer and more complicated the link, the more difficult for rivals to understand the process and to imitate the competitive resource. A manufacturer which lowers its new product development costs via feedback benefits derived from the same firm's customer service department can be a good example for value creating and imitation preventing resource interconnectedness (Dierickx and Cool, 1989).

Consequently, given their unique nature that stems from social complexity, causal ambiguity, path-dependency, historical uniqueness, and asset specificity, IRs that offer economic benefits to firms which cannot be easily acquired and replicated should have a higher impact on firm success than tangible assets. Therefore, this study offers the following hypothesis:

H1. IRs will make a larger contribution to firm performance than that of TRs.

2.2 Capabilities as the dynamic enabling mechanisms

The dynamic capabilities (DCs) perspective posits that the organisations must integrate and reconfigure their resources and capabilities to renew or alter their resource mix to be able to cope with environmental changes (Teece, 2007; Helfat and Peteraf, 2015). Several empirical studies identified specific examples of DC such as customer relationship (Chari and David, 2012), supply chain management (SCM) (Barney, 2012), client-specific capabilities (Weigelt, 2013), managerial ability (Helfat and Peteraf, 2015) and geographical and network ties (Ozer and Zhang, 2015). Although different researchers identifications is that DCs are managerial and organisational processes and their basic role is "to assess the firm's extant resource base and transform it to create a new configuration of resources that can sustain competitive advantage" (Ambrosini and Bowman, 2009, p. 32).

Compared to TR and IR, capabilities certainly remained the most amorphous and complicated to define among the constructs that constitute the RBV (Galbreath, 2004; Di Stefano *et al.*, 2014). However, despite this complexity, the RBV scholars have had a common point that human capital (Coff and Kryscynski, 2011; Ployhart and Moliterno, 2011; Kor and Mesko, 2013; Chatterji and Patro, 2014), networking capabilities (Acquaah, 2012; Weigelt, 2013; Ozer and Zhang, 2015) and business processes (Ray *et al.*, 2004, 2013; Hult *et al.*, 2007; Barney, 2012; Weigelt, 2013) were the most influential as well as vital capabilities on the way of creating performance through building, coordinating, integrating and reconfiguring organisational resource bases and competencies of firms (Teece, 2007).

2.2.1 Human capital. Ployhart and Moliterno (2011) define human capital as a "unit-level capability that is created from the emergence of individuals' knowledge, skills, abilities, and

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other characteristics" (p. 127). Human capital that comprises the skills, expertise, creativity, innovative thinking, pro-activity, collective learning, and know-how of employees and managers was considered among the most important determinants of firm success by the RBV scholars (Coff and Kryscynski, 2011; Chatterji and Patro, 2014). Teece (2007) suggests that a change in the configuration of resource base can only be achieved through market-oriented and timely strategic managerial decisions that continuously scan the capabilities landscape and environmental changes. Hall (1992) considers skills and know-how of employees as the main driver of a firm's performance since all decisions regarding how, where and when a firm will deploy its resources are made by employees. Chatterji and Patro (2014) explained the role of strategic decisions of managers and talented employees with creative and innovative skills on the way of creating firm performance through Google and Facebook cases in the context of DC framework. In a recent study, Sánchez *et al.* (2015) found that strategic human resource practices influence employee behaviour and generate positive effects in firm performance. Therefore, human capital as a DC is held to be among the most important sources of firm performance.

2.2.2 Networking capabilities. Networking capabilities that refer to the ability to build and maintain relationships external to the firm was linked to the generation of firm performance (Acquaah, 2012; Weigelt, 2013; Ozer and Zhang, 2015). Ozer and Zhang's (2015) research which examined the effects of multiplex network ties such as buyer-supplier equity, network structure and industry clusters as capabilities on innovation performance found a rigorous relationship. Similarly, Acquaah's (2012) study found that the firms which can use social networking relations and firm-specific managerial experience effectively yielded much better performance compared to other firms.

Networking capabilities provide immense benefits to the firms such as transfer of specialised knowledge (know-how), promoting customer and brand loyalty, reaching to scarce resources and closed markets, and boosting the learning ability of the firm (Weigelt, 2013; Ozer and Zhang, 2015). Moreover, especially in emerging markets where government, bureaucracy and local authorities are too much involved in business, it is very difficult for firms to reach scarce raw materials offered by local suppliers or state-owned enterprises, to gain access to distribution and communication channels controlled by local authorities, and to obtain licences issued by home governments without establishing good relations with politicians (Cavusgil *et al.*, 2013). In fact, networking relations may not be limited to government and bureaucracy. Emerging markets are called network societies where trust-based relations and longstanding connections are highly valued and social and business environment is highly affected from these relationships as a consequence of the dominant collectivist culture in these countries (Cavusgil *et al.*, 2013).

Therefore, well-established relations with suppliers, distributors and customers can provide superior advantages to firms. For example, the long-term and trust-based relationships between Ülker, the Turkish confectionery manufacturer and the owner of Godiva and United Biscuits UK, and local distributors and suppliers led to competitive advantage by enabling the firm to penetrate the African, East European and Middle Eastern markets better than its multi-national rivals such as Nestlé, Kraft's Cadbury and Milka from developed countries. As suggested by Dierickx and Cool (1989), relationships represent a capability which is built through historical and path-dependent trajectories, different to be observed by rivals, and cannot simply be traded on open. Hence, these idiosyncrasies create a formidable barrier for replication and make networking capabilities essential to a firm's success.

2.2.3 Business processes. Business processes are described as "the actions that firms engage in to accomplish some business purpose or objective" (Ray *et al.*, 2004, p. 24). Business processes provide essential infrastructural support for functional integration and maintain effective information flows that are associated directly with overall firm performance.

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For example, sophisticated in-house developed or purchased software such as intranet or electronic data interchange (EDI) enabled many banks to make fast and effective decisions and increased their customer services quality substantially by combining customer intelligence, credit, risk and funding management functions. Moreover, business processes can help firms to reveal, share and transfer tacit and embedded knowledge in the organisation through IT-based knowledge management initiatives. Many firms (e.g. Lilly and Estée Lauder) established "I have an idea" type digital platforms, which brought all internal and external parties from all
over the world together via an on-line informal network to share their ideas with respect to new product and services along with the suggestions for the operational effectiveness of the firm. As a consequence, many helpful and innovative ideas emerged from those applications.

As another business process, an effective supply chain system enables a firm to transmit its raw materials, finished goods and services in a seamless way (Hult *et al.*, 2007; Barney, 2012). As a consequence, the firms find substantial improvements in production costs and order fulfilment cycling times (the length of time between taking an order and delivery of the needed product to the customer) that are directly linked to firm performance (Ray *et al.*, 2004; Hult *et al.*, 2007). Estée Lauder's Global Supply Chain system LEAN can be a good example to illustrate how an ERP can provide operational excellence and continuous improvement in different processes of a firm. A similar application which combines all work processes and a system for managing the creation, review, approval, distribution and storage of technical specifications needed to run a consumer packaged goods company is used by P&G under the agreement MatrixOne.

Barney (2012, p. 4) states that "home grown purchasing and supply chain management capabilities are likely to be sources of advantage". In the early years of Wal-Mart, whilst supply chain system of the firm contained commodity-type of information technologies that can be obtained easily in the factor markets, the system underwent such a complex customisation over years that none of the competitors could afford to imitate it. Given their aforementioned roles and features, business processes are also likely to be among the most critically important sources of firm performance. Thus, based on the previous literature that was examined so far, the following hypotheses are offered.

In respect to the H2, TRs are described as observable, easy to acquire, and easy to replicate and do not possess the VRIN criteria to be termed as strategic resources. However, capabilities are argued to be tacit in nature, causally ambiguous and very difficult to duplicate (Barney, 1991; Galbreath, 2004). Besides, prior RBV research (Galbreath and Galvin, 2008; Schriber, 2015) suggests that the impact of capabilities on performance is greater than TRs, therefore:

H2. Capabilities will make a larger contribution to firm performance than that of TRs.

Capabilities are consider as a "superior" resource because of "their capacity to deploy resources, usually in combination, using organisational processes, to effect a desired end" (Fainshmidt *et al.*, 2016, p. 1348). Namely, they characterise the dynamic, non-finite mechanisms enabling the firm to acquire, develop and deploy all resources (including intangible ones) to create organisational performance and sustain competitive advantage (Dierickx and Cool, 1989; Helfat and Peteraf, 2015). Besides, IRs have been described as resources that are created as a result or outcome of capabilities (Galbreath and Galvin, 2008; Helfat and Martin, 2015; Fainshmidt *et al.*, 2016). For example, unique brands and a favourable corporate reputation are the results of the prior actions of the firm's managerial capabilities that comprise "managerial intentionality, deliberation, decision making, and action skills" (Helfat and Martin, 2015, p. 1285). Similarly, new products, trademarks, patents and copyrights are the results of the knowledge management and processing capabilities of the firms' (Monteiro and Birkinshaw, 2016; Yayavaram and Chen, 2015). The DC view argues that "capabilities comprise more

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metaphysical strategic insights, possess the highest levels of causal ambiguity and complex capacities that are more difficult to observe and decode" (Fainshmidt *et al.* 2016, p. 1354). These features make capabilities more resistant to competitor duplication than IRs. Therefore it is hypothesised that:

H3. Capabilities will make a larger contribution to firm performance than that of IRs.

Hypotheses that have been posited so far, mainly explored distinct associations between capabilities and TR and IR (Galbreath, 2004). But, capabilities are predominantly viewed as the most important skills that underpin the development and deployment of both TR and IR in resource-based theory (Ambrosini and Bowman, 2009; Molloy and Barney, 2015). Based on this view, it is hypothesised that:

H4. Capabilities will make a larger contribution to firm performance than the combined contributions of TR and IR.

3. Methods

3.1 Sample and informant selection

The sample was selected from the database of Istanbul Chamber of Industry (ISO) that announced the largest 1,000 firms of Turkey (ISO-1000) from different sectors annually (ISO-1000 Database, 2016). The sample designed for multiple research purposes was the best available and relevant sample that could be found in the country. Therefore, the largest 1,000 firms of 2015 were chosen and the valid names and e-mails of senior-level executives of the companies were obtained for this study. The CEO or an equivalent top manager who deal with strategy issues and have adequate knowledge to assess the firm's resource base and authority to answer the questions is chosen as the key informant (Hall, 1992; Galbreath and Galvin, 2006, 2008). Because the unit of analysis in this study was at the firm level, a single informant was used and the questionnaire was mailed to only one executive from each firm.

3.2 Administration of survey

A cross-sectional survey research design was used in the study. The measurement instrument was pre-tested by administrating a pilot study in order to assess the wording and construct reliability and validity (Saunders *et al.*, 2007). The pilot study was conducted on a sample of 42 MBA students in a foundation university in Istanbul. The participants were middle- and lower-level managers who had sufficient knowledge about the objectives of the research. The questionnaire included some space at the end of the last section for the feedback of the respondents about how the measurement instrument could be improved. No difficulty to understand the questionnaire was observed. After the pilot study, the questionnaires were sent to the e-mail addresses of the top level executives as a web-link with a covering letter that assures the privacy and confidentiality of respondents. Three weeks after the initial mailing, a reminder follow-up e-mail was also sent to be able to increase the response rate of the study (Saunders *et al.*, 2007). A total of 243 useable questionnaires were obtained, yielding a response rate of 24.3 per cent. The details about the composition of the sample are provided below.

3.2.1 *Firm size and age.* Whilst the number of full-time employees ranged from 53 to 29.372, the number of years in business ranged from 4 to 93. The details regarding means and standard deviations were shown in Table I.

3.2.2 Primary business activity. Primary business activities of the participant firms were automotive, computer and software, textile and apparels, retail, tourism, banking and finance, drugs, oil and petrochemicals, construction, logistics and transportation, telecommunications, and food. The percentage of firms in each sector was depicted in Table II.

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| EJMBE | 3.2.3 Non-response bias. Non-response bias which occurs when respondents differ from |
|-------|--|
| 26.2 | non-respondents in the sample can be considered as a common problem in surveys |
| ,_ | (Saunders et al., 2007). In order to test representation capability of the respondents for the |
| | broader population, the means of early (131 responses - 54 per cent of the sample) and late |
| | respondents (112 responses - 46 per cet of the sample) on two-key demographic variables |
| | were compared statistically via independent samples t-test (Saunders et al., 2007). As it was |
| 260 | presented in Table II, the comparison of early and late respondents did not reveal a |
| 200 | • significant difference on firm size $(t = -2.386, p = 0.354)$ and age $(t = 2.792, p = 0.193)$. |
| | Hence, non-response bias was not considered as a serious issue in the study and the |
| | respondents appeared to be representative of the broader population (Table III). |
| | |

3.3 Measurement instrument

The modified version of Galbreath and Galvin's (2008) resource-performance questionnaire which was mainly developed based on the studies of Carmeli and Tishler (2004), Fahy (2002), Spanos and Lioukas (2001) and Hall (1992) was employed in this study. The questionnaire included a total number of 45 questions: 27 questions to measure the effects of resources including both tangibles and intangibles, and capabilities, 12 questions to control the effects of industry structure factors, three questions to measure market and financial performance, and two questions for the demographics (age and size). And the last question aimed to categorise the primary business activity of the firms. The items of the questionnaire were mentioned below and presented in Table IV.

| | | п | Mean | SD | Min. | Max. |
|-------------------|-----------|-----|--------|--------|------|--------|
| Table I. | Firm size | 243 | 431.63 | 543.26 | 53 | 29.372 |
| Firm size and age | Firm age | 243 | 34.57 | 31.25 | 4 | 93 |

| | Business activity | τ | | Frequency | Percentage | |
|---------------------|-------------------|-------------|-----|-----------------|-----------------|--|
| | Automotive | | | 24 | 9.9 | |
| | Banking and fina | ance | | 21 | 8.6 | |
| | Computer and so | oftware | | 8 | 3.2 | |
| | Construction | | | 19 | 7.8 | |
| | Drugs | | | 10 | 4.1 | |
| | Food | | | 18 | 7.4 | |
| | Logistics and tra | nsportation | | 11 | 4.5 | |
| | Oil and petroche | micals | | 15 | 6.2 | |
| | Retail | | | 27 | 11.2 | |
| | Telecommunicat | ions | | 4 | 17 | |
| | Textile and appa | rels | | 35 | 14.5 | |
| Table II | Tourism | | | 13 | 5.3 | |
| Business activities | Other | | | 38 | 156 | |
| of the firms | Total | | | 243 | 100.0 | |
| | | | 14 | | | |
| | | t | df | Sig. (2-tailed) | Mean difference | |
| Table III. | Firm size | -2.386 | 237 | 0.354 | -12.78 | |
| Non-response bias | Firm age | 2.792 | 241 | 0.193 | 3.48 | |
| - | 8 | | | | | |

| Performance tems | . Profitability Sales growth Market share | Contribution of TR and IR |
|---------------------------|---|--|
| I Control variables i | Our firm has been in business foryears (AGE) Our firm has:full-time employees (SIZE) In our industry, the degree to which competitors are roughly equal in size and power is (RIVALRY) Overall market growth in our industry is (RIVALRY) The number of competitors vying for customers in our industry is (RIVALRY) The number of competitors vying for customers in our industry is (RIVALRY) The investigation in the industry is (RIVALRY) The investigation in the industry is (RIVALRY) The intensity with which competitors jockey for a better position in the industry is (RIVALRY) In our industry, the degree to which only a few competitors dominate the market (RIVALRY) The extent to which price competition is used regularly in our industry is (RIVALRY) The extent to which price competition is undustry offer clearly differentiated products/services (RIVALRY) The degree is your industry is (RIVALRY) The degree is your industry is to enter and by substitute products/services (RIVALRY) The degree is your industry is undustry threatened by substitute products/services (RIVALRY) The degree is your industry is to negotiate lower prices) do you have over your suppliers | 261 |
| Capability items | The skills, expertise and decision-making abilities of managers The overall skills, creativity, innovativeness and know- how of employees Knowledge management and sharing skills (e.g. collaborative platforms, social software, blogs, wikis) Relationships that employees and managers have established and maintained with external constituents (e.g. customers, distributors, agents, suppliers, outsourcing partners, government, etc.) for the firm's benefit Network responsiveness, co-ordination and daptation of social networks Operational processes that support the whole organisational units and help information processing about customers and markets (e.g. IT systems, call centres, CRM) FERP, supply chain and logistics systems | |
| Intangible resource items | Contracts and partnerships (e.g. joint ventures, mergers and acquisitions, agency, franchising, distribution, licensing agreements, etc.) The shared values, beliefs, attitudes and behaviours of employees and managers of the firm (e.g. firm culture) The operating and reporting structure of the firm compensation, reward, and training policies (e.g. human resource management policies) Legally protected designs (Legally protected designs trading protected designs (a Legally protected designs (b Proprietaryheld-in-secret technology (e.g. customised software, specialised manufacturing technology, software developed in-house, etc.) Dubank reputation Brand name reputation Brand name reputation Broduct/service reputation | |
| Tangible resource items | Cash (on hand/at bank) earned from operations earned from operations (e.g. secured bank loans, issuance of shares or bonds, etc.) Financial investments (e.g. financial instruments, company shares, equity positions in other companies, etc.) Physical equipment and other physical assets (e.g. machinery, tools, vehicles, etc.) Buildings and other physical structures (e.g. factories, offices, warehouses, stores, warehouses, stores, its location | Table IV. Items of the scale |

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3.3.1 TRs. TRs were measured by the items such as cash earned from operations, financial investments (e.g. stocks, bonds, equity positions in other companies), land, raw materials (in stock), physical structures and raised capital.

3.3.2 IRs. IR items include company reputation, organisational culture, customer service reputation, legally protected copyrights, designs and patents, human resource management policies, organisation structure, product/service reputation, and trademarks.

3.3.3 Capabilities. Capability items that include human capital (skills of both managers and employees), networking abilities (relationships that were established and maintained with external constituents) and business processes such as IT systems, ERP, supply chain, and logistics systems, knowledge sharing through collaborative platforms, and social software.

3.3.4 Performance items. Firm performance items were adapted from the scale of Spanos and Lioukas (2001) that includes market share, sales growth and profitability items. Hence, this study treats firm performance as a multi-dimensional rather than a single construct. Respondents were asked to indicate their firms' performance compared to competitors for the previous three-year period (2010-2012) in order to "proximate a notion of sustained performance and to mitigate against temporal fluctuations" (Galbreath and Galvin, 2008, p. 113). This study employs perceived measures to assess performance which means that subjective measures were used instead of objective measures. Perception-based performance measurement is common in strategy research (i.e. Galbreath and Galvin, 2008; Fonti *et al.*, 2017; Quigley *et al.*, 2017). Several researchers (i.e. Venkatraman and Ramanujam, 1986; Spanos and Lioukas, 2001; Bauer and Matzler, 2014) suggest that even if information is obtained by subjective measures in a sample survey research, the results are often very accurate since the measurement instrument is specifically designed to address the research questions.

However, the common use of subjective measures does not support the idea that subjective measures are more reliable than objective measures (Dess and Robinson, 1984; Venkatraman and Ramanujam, 1987; Bauer and Matzler, 2014). Besides, subjective measures should not be deemed as convenient substitutes for objective measures of a firm's financial performance. Dess and Robinson (1984) found a strong correlation between objective and subjective measures of performance indicators such as ROA and sales growth. They suggest that "where accurate objective measures of performance is strongly supported and encouraged, however, if the accurate objective measures are unavailable, then subjective perceptual measures especially, from top management teams, can be considered" (p. 270).

In Turkey, only the firms that were quoted to Istanbul Stock Exchange (BIST-100) have the responsibility of disclosing their financial information to public, periodically. But, since the sample of this study was composed of the privately owned firms and most of the firms did not have the liability and willingness to reveal their financial figures, unavailability of objective performance measures created a necessity for the researcher to use the subjective perceptual measures in the study.

3.3.5 Control variables. Firm age and size were controlled. Given that the specific nature of this study focusses on a wide range of industries, to remove whatever affect it might have on firm performance, industry effects were also systematically controlled by choosing Porter's (1980) five forces industry structure factors. Whilst a couple of demographics questions were used to control age and size effects, industry effects were controlled by the items that were derived and adapted from the Porter's (1980) five forces framework.

3.3.6 Scale. A standard Likert-type scale was used to measure various resource and performance constructs.

3.4 Reliability and validity tests

Cronbach's α coefficients were calculated to test the reliability of the constructs. The constructs that had α values equal to and above 0.70 were accepted as reliable constructs (Hair *et al.*, 2009). In order to meet the minimum coefficient threshold and gain highest possible reliability, two items were dropped. Whilst "the legally-protected designs" item was eliminated from the IRs construct, "the fixed cost structure required to compete" was dropped from the control variable construct. Table V shows each construct and its Cronbach's α value.

Factor analysis, as a common method, was used to examine construct validity. Factor analysis yielding five factors revealed that all items exceeded the cut-off point 0.50 (Hair *et al.*, 2009). Whilst the whole scale indicated a Cronbach's α reliability value of 0.839, Cronbach's α values of the constructs' scales were also fairly high: dependent variable – firm performance (0.862), TRs (0.813), capabilities (0.804), IRs (0.749), and control variable – industry structure factors (0.738). The result of the factor analysis is depicted in Table VI.

3.4.1 Correlations between key measures. Highly correlated independent variables can predict each other and may cause problems with multicollinearity which influence the accuracy of the regression analysis negatively (Hair *et al.*, 2009). Although some significant inter-correlations between the independent variables were observed (Table VII), none of the correlation coefficient was above the level considered to be serious, which is generally accepted as 0.80 or higher (Hair *et al.*, 2009). Accordingly, moderate levels of correlations among the independent variables do not seem to create multicollinearity problem.

3.5 The methodology

The data were analysed by the computer software "Statistical Package for the Social Science" (IBM – SPSS[®]) version 22.0. Apart from the results of the correlation matrix, variance inflation factor (VIF) scores were also calculated for checking the multicollinearity problem. The VIF scores were below the score recommended as problematic, which is 5 (Hair *et al.*, 2013). Furthermore, the results of Kolmogorov-Smirnov test proved that the data were normally distributed. In order to test the established hypotheses, hierarchical regression analysis was used. In hierarchical regression method, each set of independent variables is entered into separate blocks for analysis and the incremental changes of the R^2 statistics are calculated. Hence, the explanatory power or in other words, the unique contribution of each independent variable in explaining dependent variable is explored (Hair *et al.*, 2013).

4. Results

The control variables, industry structure factors and firm-level variables (TR and IR, and capabilities) were entered into regression analysis, respectively, and the contribution of each independent variable was calculated. The abbreviations of the variables are given below:

- AGE is the firm age;
- SIZE the firm size;
- IND the industry structure factors;

| Construct | Initial items | Final items | Cronbach's α | |
|---------------------------------------|---------------|-------------|---------------------|--------------------------|
| Tangible resources | 7 | 7 | 0.813 | |
| Intangible resources | 13 | 12 | 0.749 | |
| Capabilities | 7 | 7 | 0.804 | |
| Industry control variable | 12 | 11 | 0.738 | Table V |
| Firm performance (dependent variable) | 3 | 3 | 0.862 | Reliability coefficients |

Contribution of TR and IR

| EJMBE 26.2 | Items | F1: TR | F2: IR | F3: CAP | F4: Ind. CONT | F5: PER |
|---------------|--|---|---|---|---|----------------|
| 26,2 264 | Items Q4. Physical equipment and other physical assets Q11. Cash (on hand/at bank) earned from Q9. Raised financial capital Q16. Buildings and other physical structures Q13. Raw material (in stock) Q23. Financial investments Q21. Land, including its location Q7. Legally protected trademarks Q1. Contracts and partnerships Q14. Brand name reputation Q3. The operating and reporting structure Q8. The shared values, beliefs, attitudes and Q20. Legally protected patents Q10. Customer service reputation Q21. Legally protected patents Q22. Legally protected patents Q23. Proprietary/held-in-secret technology Q24. Legally protected copyrights Q15. The overall skills, creativity, innovativeness Q6. The skills, expertise and decision making Q27. Operational processes that support Q28. Organisational routines Q29. Overall market growth in our industry Q35. The degree to which competitors offer Q30. The number of competitors vying for Q32. The intensity with which competitors jockey Q32. The intensity with which co | 0.787 0.754 0.739 0.715 0.686 0.613 0.598 | 0.802 0.792 0.755 0.734 0.721 0.704 0.699 0.683 0.659 0.639 0.632 | 0.816 0.785 0.749 0.676 0.623 0.592 0.583 | 0.838 0.798 0.763 0.737 0.726 0.719 0.693 0.663 0.645 0.614 0.608 | 0.813 0.770 |
| | Notes: Overall reliability of the scale ($\alpha = 0.839$). Factor | r's Cronb | ach's α | reliability o | coefficient $\alpha = 0.8$ | 313, 0.749, |

Table VI. Factor analysis **Notes:** Overall reliability of the scale ($\alpha = 0.839$). Factor's Cronbach's α reliability coefficient $\alpha = 0.813, 0.749, 0.804, 0.738, 0.862$. Kaiser-Meyer-Olkin sampling adequacy: 0.9476**. Barttlet's test of approx. χ^2 sphercity: 16,435.0**. **p < 0.01

- TR the tangible resources;
- IR the intangible resources; and
- CAP the capabilities.

4.1 H1

Model 1 shows the separate effects of control variables (age, size and industry factors) along with the TRs and their explanatory power in firm performance (see Table VIII). Namely, without other variables, age, size, industry factors and TR explained 12.6 per cent

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Contribution of TR and IR |
|--------------------------------|-------------------|--------|---------|--------|---------------|--------------|---------|---------|---------|---------|------|---------------------------|
| Control | | | | | | | | | | | | |
| Firm size | 431.63 | 543.26 | 1.00 | | | | | | | | | |
| Firm age Industry | 34.57 | 31.25 | 0.002 | 1.00 | | | | | | | | |
| factors | 3.267 | 1.236 | -0.007 | -0.112 | 1.00 | | | | | | | 265 |
| <i>Independent</i> Tangible | | | | | | | | | | | | |
| resources Intangible | 1.497 | 0.9476 | 0.176* | 0.182* | -0.097** | 1.00 | | | | | | |
| resources | 2.778 | 0.7883 | 0.089* | 0.073 | -0.046 | 0.214** | 1.00 | | | | | |
| Capabilities | 3.582 | 0.5364 | 0.210* | 0.147* | 0.003 | 0.186** | 0.265** | 1.00 | | | | |
| <i>Dependent</i> Sales | | | | | | | | | | | | |
| turnover | 5.167 | 1.569 | 0.069 | 0.002 | 0.054 | 0.003 | 0.099** | 0.281** | 1.00 | | | |
| Market | | | | | | | | | | | | |
| share | 4.872 | 1.395 | 0.008 | 0.056 | -0.083^{**} | 0.110^{**} | 0.164** | 0.376** | 0.393** | 1.00 | | |
| Profitability | 5.329 | 1.482 | 0.095** | 0.143* | 0.032 | 0.197* | 0.239** | 0.388** | 0.402** | 0.436** | 1.00 | Table VII. |
| Notes: *p < | 0.05; ** <i>p</i> | < 0.01 | | | | | | | | | | Correlation analysis |

 $((R^2 = 126); (F = 2.345, p < 0.05))$ of sales turnover, 8.9 per cent $((R^2 = 0.089); (F = 1.438, p < 0.01))$ of market share and 13.9 per cent $((R^2 = 0.139); (F = 2.998, p < 0.001))$ of profitability.

Having entered the IRs variable to model 2, the variations in sales turnover, market share and profitability increased to 15.7 per cent (($R^2 = 0.157$); (F = 2.761, p < 0.05)), 10.4 per cent (($R^2 = 0.104$); (F = 1.663, p < 0.05)) and 18.1 per cent (($R^2 = 0.181$); (F = 3.586, p < 0.01)), respectively. Thus, entrance of the IR variable provided an additional and significant explanation power 3.1 per cent ($\Delta R^2 = 0.031$) for sales turnover, 1.5 per cent ($\Delta R^2 = 0.015$) for market share and 4.2 per cent ($\Delta R^2 = 0.042$) for profitability in model 2.

IRs make a unique, individual contribution to firm performance after accounting for the effects of TRs and the control variables (see Table VIII). Across all three performance measures, the IR β coefficients are the largest and significant compared to the TR β coefficients.

Sales turnover; TR ($\beta = 0.194$, t = 2.745, p < 0.001); IR ($\beta = 0.236$, t = 2.988, p < 0.001). Market share; TR ($\beta = 0.078$, t = 1.367, p < 0.01); IR ($\beta = 0.122$, t = 2.174, p < 0.01). Profitability; TR ($\beta = 0.379$, t = 3.055, p < 0.001); IR ($\beta = 0.475$, t = 3.269, p < 0.001).

Given the analysis results, IRs are positively associated with all performance measures and make a larger contribution to firm performance than TR. Thus, *H1* is supported.

4.2 H2

Having entered the capabilities variable (CAP) to model 2, significant changes in R^2 s were observed across all dependent variables (see Table VIII). The variations in sales turnover, market share and profitability increased to 14.9 per cent (($R^2 = 0.149$); (F = 2.598, p < 0.05)), 11.8 per cent (($R^2 = 0.118$); (F = 1.742, p < 0.01)) and 21.4 per cent (($R^2 = 0.214$); (F = 4.136, p < 0.01)), respectively. Entrance of the CAP variable provided an additional and significant explanation power 2.3 per cent ($\Delta R^2 = 0.023$) for sales turnover, 2.9 per cent ($\Delta R^2 = 0.029$) for market share and 7.5 per cent ($\Delta R^2 = 0.075$) for profitability in model 2. Therefore, CAP account for significant additional exploratory power to the prediction of the dependent variables after simultaneously accounting for the effects of TR and the control variables.

| EJMBE 262 | | Sales | turnover | Mark | tet share | Prof | itability | |
|------------------------------|---|---|---|---|--|---|---|--|
| 20,2 | Variables | β | t | β | t | β t | | |
| 266 | H1 Constant AGE SIZE IND TR IR | 0.023 0.019 0.073 0.194 0.236 | 6.548*** 0.398 0.736 1.263** 2.745*** 2.988*** | -0.044 0.009 0.139 0.078 0.122 | 6.933*** -0.359 0.547 1.941** 1.367** 2.174** | -0.127 0.016 -0.008 0.379 0.475 | 7.425** -0.446 0.697 -1.897 3.055*** 3.269*** | |
| | Model 1 (w/out IR) R^2 F Multip (id. ID) | 0. 2. | .126 .345* | 0 1 | 0.089 438** | (|).139 2.998*** | |
| | R^{2} $\Delta R^{2} \text{ (change in } R^{2}\text{)}$ F | 0. 0. 2. | 157 031 761* | 0 0 1 | .104 .015 .663* | ((: |).181).042 3.586** | |
| | H2 Constant AGE SIZE IND TR CAP Model 1 (w/out CAP) R^2 F Model 2 (with CAP) R^2 | 0.019 0.004 0.056 0.178 0.304 0. 2. | 6.239*** 0.364 0.547 1.092** 2.431** 3.247** 126 345* | -0.062 0.052 0.116 0.063 0.156 | 6.128*** -0.386 0.603 1.897* 1.184** 2.105** 0.089 .438** | -0.045 0.013 -0.014 0.204 0.498 | 7.298** -0.239 0.655 -1.933 2.446** 3.507** 0.139 2.998*** | |
| | ΔR^2 (change in R^2) F | 0. 2.5 | .023 598* | 0 | .029 742** | (4. |).075 136** | |
| | H3 Constant AGE SIZE IND IR CAP Model 1 (w/out CAP) R^2 F | 0.006 0.013 0.064 0.276 239 0. 2. | 6.933*** 0.286 0.654 1.213*** 3.134* 3.002* 1.51 767*** | 0.002 0.052 0.103 0.147 0.135 | 7.632*** 0.252 0.495 1.619** 2.336** 2.228** 103 .665** | | 8.038*** 0.206 -0.449 1.553 2.165** 3.198** 0.176 3.459*** | |
| | Model 2 (with CAP) R^2 ΔR^2 (change in R^2) F | 0. 0. 2. | 0.165 0.014 2.087** | | 0.124 0.021 .865** | ((3 |).203).027 3.631*** | |
| Table VIII. Statistics of | H4 Constant AGE SIZE IND TR IR CAP | $\begin{array}{c} - \\ 0.005 \\ 0.017 \\ -0.029 \\ 0.126 \\ 0.143 \\ 0.129 \end{array}$ | 5.196^{***} 0.411 0.623 -1.784^{**} 1.532^{*} 1.878^{**} 1.645^{**} | $\begin{array}{c} -0.006\\ 0.003\\ -0.054\\ 0.056\\ 0.152\\ 0.121\end{array}$ | 4.875*** -0.312 0.431 -1.863** 1.418** 1.965** 1.629** | $\begin{array}{c} -0.004\\ 0.008\\ -0.011\\ 0.109\\ 0.262\\ 0.311\end{array}$ | 5.683*** -0.373 0.505 -1.442 1.769* 2.477** 2.881** | |
| hypotheses | | | | | | | (continued) | |

| | Sales tu | rnover | Mark | et share | Pro | fitability | Contribution |
|---------------------------------|-------------------------------|--------|------|----------|---------------|------------|--------------|
| Variables | Variables β t β t | | β | t | 01 1 K anu ik | | |
| Model 1 (w/out CAP) | | | | | | | |
| R^2 | 0.13 | 57 | 0. | 104 | (| 0.181 | |
| F | 2.70 | 51* | 1. | .663* | : | 3.586*** | |
| Model 2 (with CAP) | | | | | | | |
| R^2 | 0.10 | 56 | 0. | .116 | (| 0.209 | 267 |
| ΔR^2 (change in R^2) | 0.00 | 09 | 0. | .012 | (| 0.028 | |
| F | 2.3 | 30 | 2. | .017** | : | 2.884** | |
| Notes: *p < 0.05; **p < 0 | 0.01; ***p < 0.01 | 001 | | | | | Table VIII. |

CAP have the largest β coefficients of any of the independent variables in the regression model (see Table VIII). In *H2*, CAP have a larger β coefficient across all of the performance measures, than TR as shown below.

Sales turnover; TR ($\beta = 0.178$, t = 2.431, p < 0.01); CAP ($\beta = 0.304$, t = 3.247, p < 0.01). Market share; TR ($\beta = 0.063$, t = 1.184, p < 0.01); CAP ($\beta = 0.156$, t = 2.105, p < 0.01). Profitability; TR ($\beta = 0.204$, t = 2.446, p < 0.01); CAP ($\beta = 0.498$, t = 3.507, p < 0.01).

These results suggest that CAP are positively associated with all performance measures and more important to explaining firm performance than TR. Therefore, the findings of the analysis offer support for H2.

4.3 H3

The addition of CAP to model 2 that includes control variables along with IR results significant changes in R^2 s across all performance measures (see Table VIII). The variations in sales turnover, market share and profitability increased to 16.5 per cent (($R^2 = 0.165$); (F = 2.087, p < 0.01)), 12.4 per cent (($R^2 = 0.124$); (F = 1.865, p < 0.01)) and 20.3 per cent (($R^2 = 0.203$); (F = 3.631, p < 0.001)), respectively. Entrance of the CAP provided an additional and significant explanation power 1.4 per cent ($\Delta R^2 = 0.021$) for sales turnover, 2.1 per cent ($\Delta R^2 = 0.021$) for market share and 2.7 per cent ($\Delta R^2 = 0.027$) for profitability in the regression model. Thus, CAP account for significant additional exploratory power to the prediction of the dependent variables after simultaneously accounting for the effects of IR and the control variables.

With regard to the unique, individual contribution of CAP to explain performance relative to the other independent variables, the results were mixed (see Table VIII). For sales turnover, the β coefficient for CAP was $\beta = 0.239$ (t = 3.002, p < 0.05) which was smaller than IR coefficient of $\beta = 0.276$ (t = 3.134, p < 0.05). Similarly, for market share, the β coefficient for CAP was $\beta = 0.135$ (t = 1.184, p < 0.01) which was also smaller than IR coefficient of $\beta = 0.276$ (t = 3.002, p < 0.05). Similarly, for market share, the β coefficient for CAP was $\beta = 0.336$ (t = 3.134, p < 0.01) which was also smaller than IR coefficient of $\beta = 0.147$ (t = 2.336, p < 0.01). For profitability, the β coefficient for CAP was $\beta = 0.363$ (t = 3.198, p < 0.01) compared to IR coefficient of $\beta = 0.287$ (t = 2.165, p < 0.01). Given these results, CAP make larger contributions in only one of the three dependent variables that is profitability. Thus, the findings of the analysis offer only partial support for *H3*.

4.4 H4

The addition of CAP to the model including the control variables along with the combined contributions of TR and IR results significant R^2 change only for profitability (see Table VIII). Whilst entrance of the CAP increased explanation power of the model significantly from $R^2 = 0.181$ to $R^2 = 0.209$ (($\Delta R^2 = 0.028$); (F = 02.884, p < 0.01)) for profitability, R^2 changes in sales turnover and market share were non-significant. Hence, in only profitability do CAP account for significant additional explanatory power to the prediction

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of firm performance after simultaneously accounting for the effects of both TR and IR along with the control variables.

With regard to the unique, individual contribution of CAP to explain performance relative to TR and IR, the results were weak (see Table VIII). For sales turnover, the β coefficient for CAP was $\beta = 0.129$ (t = 1.645, p < 0.01) which was smaller than IR coefficient of $\beta = 0.143$ (t = 1.878, p < 0.01) and slightly larger than TR coefficient of $\beta = 0.126$ (t = 1.532, p < 0.05). For market share, the β coefficient for CAP was $\beta = 0.121$ (t = 1.629, p < 0.01) which was again smaller than IR coefficient of $\beta = 0.152$ (t = 1.965, p < 0.01) but larger than TR coefficient of $\beta = 0.056$ (t = 1.418, p < 0.01). For only profitability, the β coefficient for CAP was $\beta = 0.311$ (t = 2.881, p < 0.01) larger compared to $\beta = 0.109$ (t = 1.769, p < 0.05) of TR and $\beta = 0.262$ (t = 2.477, p < 0.01) of IR.

Given these results, CAP make larger contributions in only one of the three dependent variables that is profitability. Thus, the findings of the analysis do not offer support for *H4*.

Based on the results of the statistical analysis, only two hypotheses that posited the larger contributions of IRs (H1) and capabilities (H2) on firm performance compared to TRs were fully accepted. Whilst the data that were analysed offered only a partial support for H3 that posited a larger contribution of capabilities on firm performance compared to IRs, H4 suggesting a larger contribution of capabilities compared to the combined contribution of TR and IR was rejected. A summary of the findings was presented in Table IX.

5. Discussion and managerial implications

The analysis revealed some noteworthy results. In testing the H1, although the relative contribution of IRs was significantly higher than TRs, the difference was not considerable and TRs were still significantly associated with all performance measures (especially with sales turnover) and offered unique contributions to firm performance. Moreover, the additional explanatory power of IRs on performance measures was significant but limited. These results show that against the dominant effect of IRs on performance, TRs still have a non-negligible impact in contributing firm performance within the context of Turkish business environment.

5.1 Unexpected TR effects

The reason for this unexpected TR effect on performance may be linked to the previous competitive strategy choices of the Turkish firms in global markets. With the support of low labour cost, most of the Turkish firms preferred adopting a low-cost strategy and investing on TRs that enable the firms achieve high amount of production. A low-cost strategy relies "heavily on the ability to improve the manufacturing efficiencies in the firm's value chain" (Spanos *et al.*, 2001, p. 643). Although manufacturing software, relative effects of the TRs such as low-cost raw material and labour, modern machinery and equipment, and physical

| | Hypotheses | Findings |
|-------|---|---------------------|
| | <i>H1</i> : intangible resources will make a larger contribution to firm performance than that of tangible resources | Supported |
| | <i>H2</i> : capabilities will make a larger contribution to firm performance than that of tangible resources | Supported |
| | <i>H3</i> : capabilities will make a larger contribution to firm performance than that of intangible resources | Partially supported |
| sults | H4: capabilities will make a larger contribution to firm performance than the combined contributions of tangible and intangible resources | Not supported |

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Table IX. Summary of resu buildings and manufacturing plants are greater (Grimpe and Hussinger, 2014). Another factor that can explain the finding of strong TR effect on firm performance is that until early 2000s, the Turkish trade and commercial laws did not have deterrent penalties against the firms violating intellectual property rights in the country. Hence, this situation might also direct Turkish firms to focus on just manufacturing at lower costs in order to sustain competitive advantage rather than offering differentiated services and products to the markets. Under these conditions, many Turkish firms developed a special expertise for manufacturing imitated products (e.g. Lacoste, Louis Vuitton and Tommy Hilfiger). Developed countries have a strong historical economic tradition based on free market structure, liberalisation and legal protection for intellectual property which enabled the firms of these countries make relatively more thorough strategic decisions in line with the requirements of new economy where service sector has a high share and IRs are in the focal concern. So, the discrepancies concerning the relative importance of TR vs IR and capabilities on firm performance between the results of similar types of studies conducted in Western countries (Spanos and Lioukas, 2001; Galbreath and Galvin, 2006; Weigelt, 2013) can be explained in this manner and this study may be attributed to the remnants of the past Turkish economic growth model and competitive strategy choices of the Turkish firms.

In *H2*, the capabilities did not only contribute firm performance significantly higher than TRs, but they also accounted for the largest β values in the context of all hypotheses and regression models. Moreover, apart from the profitability measure on which a considerable contribution was achieved, capabilities provided significant but relatively limited contribution to other performance measures. Therefore, evidence was found to suggest that capabilities are among the most important determinants of a firm's market and particularly, financial performance.

A partial support was offered for *H3* which examined the relative impact of capabilities compared to IRs. One explanation for this partial support might rest with capability and IR interconnectedness (Dierickx and Cool, 1989; Sirmon *et al.*, 2011). For example, reputational resources (e.g. corporate reputation, customer/product service reputation or brand name) which are among the IR categories might be described as an outcome or the result of previous successful marketing or communication activities of a firm's managerial and/or networking capabilities. In another example, IT systems or collaborative platforms which are among the capability constructs might be described as the outcomes of the in-house developed software that is an IR construct. Hence, when taken in the context of the broader resources necessary to build a capability such as an IT system, its impact on firm performance measures might not be as significant as found by past studies, many of which isolate on an IT system as a stand-alone capability (Ray *et al.*, 2004, 2013). Lastly, the findings demonstrate that idiosyncratic stock of static resources and capabilities that are dynamic in nature become complementary while they create performance and they are likely to represent "the two sides of the same coin" (Wernerfelt, 1984).

The findings of the final H4 were inconclusive. Capabilities offered rather limited additional explanatory power to the prediction of firm performance only with respect to profitability against the combined effects of TR and IR. One possible explanation for the rejection of (H4) is that the hypotheses of this study were too broadly stated and firm performance was measured too narrowly. In reality, different resource categories and different types of capabilities may have varying influence on firm performance. As an example, the effects of human capital (which is a DC) may vary across different manifestations of firm performance but human capital which consists a number of human-related skills such as leadership and strategic decision-making abilities, employee know-how, creative skills of managers and/or employees, etc. was considered as a general capability construct. However, each skill that constitutes a whole capability construct can have different indirect effects within the context of different performance constructs such as

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number of new products and processes developed, new ideas generated, strategic partnerships established that may be the predictors of market and financial performance constructs used in this study. Although these skills, to some extent, may create performance repercussions on the final performance constructs, their real performance effects might largely remain on the mediating performance constructs.

5.2 Capabilities as determinants of performance

As an ultimate point, capabilities were found as the most important determinants of firm performance in the Turkish business context. Our capability construct included three sub-categories: human capital, networking capabilities and business processes. Although those sub-category capabilities have generated a total impact on firm performance as a general capability construct, their influence should be analysed separately.

Human capital can be seen as an important strategic initiative and enabler in the process of performance creation in the Turkish business context. One explanation for the important role of human capital might be related to the lack of high quality human resource and the existence of inefficiency in working life in the country (World Economic Forum, 2013). Given the conditions of incapability and inefficiency among workforce, more managerial supervision, initiation, control and interaction is required. Furthermore, integration of highly dynamic business environment with incapable workforce may complicate jobs of the managers and compel them to be even more interactive and intervening in every business function of the firms. Bearing in mind that, continuing immigration of skilled human capital from Turkey to Western countries (World Economic Forum, 2013) may have worsened the situation and due to the lack of necessary skilled human resource stock in the country, the qualified managers in firms may have taken additional burdens on their shoulders that force them to be more intervener and interactive in the process of firm performance creation. This position may increase the need of highly skilled employees even more and hence, the participants may have emphasised the vital importance of human capital for performance in the research. Thus, acquiring, attracting, retaining and motivating human capital through effective HRM policies such as developing a unique culture via shaping the spoken and unspoken norms and rules of the firm that creates a working atmosphere and environment for maximum worker productivity and performance should be management priorities.

With respect to networking capabilities, Turkey is a country where nepotism, friendship and trust-based relationship can be seen in every part of life as well as business life (Ozbilgin, 2011). Moreover, existence of poor institutional environment which leads to corruption, high levels of bureaucracy and red tape that can result to inefficiencies may compel firms to establish relations with politicians and bureaucrats. Therefore, given these characteristics of the country, the firms in Turkey may have developed special networking capabilities for relationship-based management. As a managerial implication, managers of the firms in Turkey should spend much of their time on day-to-day operations and establish relations with executives in governmental institutions. The development plans and programmes of political parties should be followed by managers cautiously. As such, the recent administrations which attempt to execute some economic activities with religious references (e.g. 0 per cent interest in the economy, extreme limitation for the sales of alcoholic beverages, utilisation of public services for some groups tendentiously) should be considered for the efficacy of managerial planning and control.

Relating to business processes, rapid and discontinuous changes are common in Turkish economy where political instability, financial volatility and discursive consumer shifts occur. In this situation, business processes such as IT skills, ERP, EDI and SCM systems enable firms to have sufficient intelligence pertaining to current and future customer needs, competitor strategies and actions, channel requirements, and the broader business environment and provide them agility to respond market demands quickly (Ray *et al.*, 2004, 2013).

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Since the firms in Turkey operated in a harsh business environment, most of them survived by finding idiosyncratic solutions to the unpredicted and unexpected problems, adopting new alternative strategies, or modifying the existing ones that increase the speed and scope of their strategic manoeuvring actions. Hence, Turkish firms may have given priority to invest in business processes to address their strategic flexibility requirements and after a while they may have acquired special skills to be able to operate in unreliable business environments. Given the hyper changing business conditions in the country, managers of the firms should pay attention to establish early warning systems along with rapid information and market intelligence providing mechanisms. In this sense, allocation of resources in favour of business process development such as strengthening IT infrastructure, SCM and logistics systems should be a concern for managers. However, resource allocation and the optimal deployment of strategic resources is a key managerial challenge and priority should be given to the most important ones.

6. Limitations and future research directions

Three limitations are highlighted in this study: first, the context-specific nature of firm-level resources compelled the researcher to establish the hypotheses testing the relative importance of resources on firm performance empirically in broad nature. Namely, only general resource categories, TR and IR, and capabilities were used but sub-categories of these resources were omitted. As a future research direction, a construct set that includes a broader but not exhaustive number of resources and capabilities might be helpful for a better investigation of resource and capability and performance relationship.

Second, in all research, objective performance measures should be used where possible and available. However, given the limitation of obtaining the financial figures of the firms investigated that were not offered to public, this research uses perception-based performance measurement. Thus, it should be noted that performance evaluations of top level managers might produce biased results.

Third, the cross-sectional nature of the study provides a snapshot about the issue for a specific point in time but gives no indication of the sequence of events. Therefore, the findings of this study are not guaranteed to be representative for the following years and need validation and verification over time.

Fourth, limitation of this research is about what is captured and not captured with respect to resource and capability effects. Some resources and/or capabilities may predict each other and affect their power of impact on performance. So, whether some resources or capabilities might be contributing to competitive advantage in some unique way as a mere reflection of a resource (or a capability) that is necessary to maintain survival in the market, or are an effect resulted from the resource-capability interaction is not known. Although research findings provide valuable insights with respect to resource and capability contribution to firm performance, the mechanisms (moderating and mediating effects) between resource and capability interactions in performance creation are more than just complex and need further investigation and also some degree of confirmation.

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