# Marketing-specific intellectual capital: conceptualization, scale development and empirical illustration

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## Abstract

**Purpose** – The aims of this paper are to identify and classify the knowledge resources that shape intellectual capital (IC) within the marketing function, to develop and validate a related scale and to demonstrate the scale's applicability in an empirical context.

**Design/methodology/approach** – A literature-based approach was adopted to identify and classify knowledge assets in the field of marketing. The new scale's content was then tested in a number of companies with different profiles. A subsequent survey of a representative sample of 346 Spanish firms sought to validate the scale and to assess those companies' marketing-related IC.

**Findings** – The literature search provided the basis for a marketing-related IC architecture comprising three main categories, nine subcategories and eighty items whose validity was tested and confirmed. The survey revealed that marketing-specific human capital (HC) is the most developed knowledge resource in Spanish firms, followed by marketing-specific relational capital (RC), while marketing-specific structural capital (SC) is the least developed. Significant differences were also found among companies with different profiles (B2C vs B2B, high-tech vs low-tech and manufacturing vs services).

**Originality/value** – This study makes a valuable contribution to the IC literature as one of the first to deploy the general IC framework in a specific functional area (here: marketing and sales) for more meaningful and in-depth assessment of firm-specific knowledge resources.

**Keywords** Intellectual capital, Knowledge resources, Marketing, Scale development, Spain

**Paper type** Research paper

## 1. Introduction

According to the knowledge-based view (Grant, 1996; Spender, 1996), knowledge is a firm's most strategically important resource, since it is considered the cornerstone of competitive advantage and value creation. For that reason, managers need to focus on producing, acquiring, retaining and utilizing knowledge (Spender, 1996). An organization's combined knowledge resources constitute its intellectual capital (IC) (e.g. Nahapiet and Ghoshal, 1998; Sullivan, 1999; Youndt *et al.*, 2004).

However, even though some authors equate IC to knowledge, others consider that IC encompasses all kinds of intangible resources (e.g. Brooking, 1996; Edvinsson and Malone, 1997; Sveiby, 1997; Roos *et al.*, 1998; Marr, 2006). Giving the prominent role of such resources in the generation of superior and unique returns for firms (due to their substantive

inimitability), the early IC literature put great emphasis on taking stock of IC components and its constituents. Usually, a three-component classification has been suggested in which intangible and/or knowledge resources are sorted out according to where they reside: people (i.e. human capital (HC)), the organization (i.e. structural or organizational capital) or relationships (i.e. relational or social capital). Thus, IC components constitute designed or constructed conceptual variables with the aim to logically structure the intangible assets of the firm.

After the effort made in inventorying and classifying IC, numerous studies have been carried out to analyze its influence on company performance (for a review, see Inkinen, 2015). Many of them set out from the IC categories previously identified and tried to prove the influence of each IC component on performance using "constructs" or "proxy variables" made up of several indicators that try to capture their content. Despite the designed or constructed nature of such components, common factor models (see Bagozzi, 2011) have mostly been applied, as if they were referring to actually existing unobservable variables that give rise to the indicators included in each subscale (i.e. human, structural/organizational and relational/social capital). However, when a conceptual variable is viewed as a combination of different elements (i.e. when such elements "define" the variable but do not cause it), a composite measurement model applies (Henseler, 2017).

Beyond this general methodological challenge, the wide spectrum of elements that could be included within each IC component poses additional measurement problems. First, as the majority of existing studies analyze the influence of IC on performance with a single construct per IC component, a selection is made by authors about the specific elements to be included in each IC category, which affects the comparability of the results obtained. Second, when very heterogeneous aspects are included within the same construct, each of them tends to be represented by very generic and synthetic indicators. Thus, analyses on the IC-performance linkage based on such indicators provide very little information beyond highlighting the relevance of hiring bright and skilled people or that of investing in information systems and documenting knowledge. Moreover, very often the scales used (e.g. Bontis, 1997; Hsu and Fang, 2009) mix practices, resources and outcomes within the same construct, which implies that dependency relationships between such elements may also exist.

Therefore, to improve the relevance and consistency in IC measurement, in the current study a proposition is made to concentrate clearly on knowledge resources (i.e. to exclude other intangible assets, practices and outcomes) and to take a more specific approach into the qualities of knowledge. As pointed out by Kianto *et al.* (2018), one of such qualities is *contextuality*: knowledge is always a contextual phenomenon, with strong local and institutional components, something that has been largely overlooked by the IC literature. Although since 1998 onwards IC-performance studies exist that have been carried out in different contexts (especially in terms of industry, ownership, company size and type of country), these studies do not seek to highlight the specific types of knowledge or intangible items that may be of particular interest in these contexts, but they rather aim to show the general relevance of IC by using generic scales as discussed previously.

To overcome this research gap and considering that organizational units or functions constitute one of the less studied contexts in previous IC research, this study examines IC in the context of the *marketing and sales function* as a distinct but broadly relevant organizational domain. According to Porter (1985), while all of a business's functional areas contribute to the delivery of goods and services, marketing plays a key role in adding and creating value for customers. Additionally, the numerous and rapid changes in the marketing field have consequences for the knowledge resources needed for successful performance of this function. Marketing is therefore relevant in the present context in light

of its key role in attracting and retaining customers and shaping innovation and value creation, all of which are essential for company survival (see for example Kotler and Armstrong, 2018).

By distinguishing between human, organizational/structural and social/relational capital (RC) (Youndt *et al.*, 2004) within the marketing context, a measurement scale will be proposed that provides a more fine-grained instrument for researchers assessing the influence of domain-specific knowledge resources on marketing capabilities and performance. This will in turn provide more tailored recommendations for marketing professionals in relation to managing IC. Marketing managers can also use the scale as a self-assessment tool to diagnose the knowledge-related strengths and weaknesses of the marketing function. More broadly, the development of a domain-specific IC scale serves to demonstrate the utility of more tailored but generalizable approaches to IC measurement.

Next, a literature review will be presented on the conceptualization, categorization and specification of IC and its consequences for empirical research, including an overview of IC-performance studies in specific contexts. Research design will then be explained, whereupon knowledge resources that shape IC within the marketing function will be identified and classified. Subsequently, a scale to measure marketing-specific IC will be developed and validated before being empirically illustrated in a survey of 346 Spanish firms. Implications for research and practice will be discussed in the end.

## 2. Theoretical background

### 2.1 Conceptualization, categorization and specification of IC

IC has been conceptualized via multiple definitions in the literature, each of them providing different insights. After a careful examination of some of the most popular ones (see the Appendix for a chronological compilation of IC definitions in the literature), two main groups of definitions emerge.

The first group views IC as the sum of all intangible resources that make up the invisible part of the firm's balance sheet. Authors such as Brooking (1996), Edvinsson (1997), Edvinsson and Malone (1997), Sveiby (1997), Roos *et al.* (1998) and Marr (2006) clearly adopt this perspective. The second group, however, is more restrictive and views IC as the sum of all knowledge that firms leverage to gain competitive advantage (i.e. knowledge is the only intangible resource included). Authors such as Nahapiet and Ghoshal (1998), Sullivan (1999) and Youndt *et al.* (2004) clearly adopt this view, while other prominent contributors like Stewart (1997) and Bontis (1998) adopt a more intermediate position, as they emphasize the role of knowledge but consider other intangible resources as well.

Whichever the perspective adopted, the definitions of IC split it up into different categories. Although the specific labels may vary, usually a three-component classification is suggested in which intangible or knowledge resources are sorted out according to where they reside. Such criterion also reflects the capability of the firm to retain and preserve its sources of value creation: while human-centered assets (i.e. intangible or knowledge resources residing in people) disappear when employees leave, structural resources (i.e. those residing in the organization itself) remain within the firm. RC occupies an intermediate position because even though social relationships involve human participation, changes in the people involved do not necessarily mean institutional relationships fully disappear. Knowledge and other intangible resources derived from them may change, but relationships might be preserved.

According to the IC-based view of the firm (Reed *et al.*, 2006), intangible resources (and knowledge resources in particular) constitute the principal source of superior returns, and thus companies must develop strategies to leverage them. For this to be possible, these "hidden" sources of value creation need to become apparent in one way or another. This is

why early IC literature put great emphasis on taking stock of IC components and their constituents.

In the case of *human capital* (HC), the following were identified (see the Appendix for specific contributions and references):

(1) Knowledge-related elements, namely: individual explicit knowledge or "conscious" knowledge (i.e. knowledge about facts, concepts and frameworks); individual tacit knowledge or "automatic" knowledge (i.e. skills, abilities, know-how, capabilities, competences and expertise) and employees' training and experience (i.e. aptitudes).

(2) Other intangible resources, such as: values, attitudes (e.g. flexibility), motivation, satisfaction, loyalty and the firms' commitment to support employees' competences and capabilities.

Regarding *structural capital* (SC), the following constituents were suggested:

(1) Knowledge-related elements: objectified knowledge (i.e. intellectual property, written knowledge, documents, databases, process manuals, methodologies, policies and procedures); organizational routines and organizational capabilities or know-how.

(2) Other intangible elements, such as: technological infrastructure (i.e. technologies, computer and administrative systems, software and communication systems); organizational structure; internal networks; processes; organizational culture; leadership and management style; management systems (e.g. incentive schemes) and R&D efforts.

In the case of *relational capital* (RC), the focus was initially only on customer relationships, as is highlighted by the fact that RC was labeled as "customer capital" in some contributions. Over time, however, the scope of external relationships broadened, including relationships with other external stakeholders and even considering internal relationships as well (Youndt *et al.*, 2004). In this respect, the evolution of the so-called "social capital" concept and its linkage with RC is noteworthy. When Nahapiet and Ghoshal (1998) used the concept for the first time in connection to the IC literature (see Appendix), they were considering social capital as a key driver of IC and not as an IC component in itself (in their view, IC was made up of individual explicit and tacit knowledge – i.e. HC – and of social explicit and tacit knowledge – i.e. SC). Some years later, Youndt *et al.* (2004), recovered the concept and presented it as an IC component together with human and organizational (i.e. structural) capital. Their definition was very similar to that of Nahapiet and Ghoshal (1998), while only focusing on knowledge resources.

With the exception of Youndt *et al.* (2004) and their precursors Nahapiet and Ghoshal (1998), RC constituents found in the literature have been mainly external to the firm and different from knowledge. These consist of external relationships themselves (i.e. relationships with customers, suppliers, alliance partners, shareholders and other external stakeholders); the company's customer base; distribution channels; contracts and agreements; commercial power; image-related assets (i.e. brands, trademarks and corporate reputation) and customer-related outcomes (i.e. customer satisfaction, backlog, repeat business, customer loyalty, customer penetration, customer coverage and customer profitability).

The above compilation of constituents shows a broad and varied spectrum of elements within each IC category which confirms their "constructed" nature. Each IC component is defined by a combination of knowledge and/or intangible resources that have been grouped together according to where they reside (people, the organization itself or social relationships). These elements do not necessarily emerge from an underlying common

factor (i.e. they do not necessarily share a common root or cause) and hence do not necessarily evolve in the same direction. This is important because when empirical research tries to analyze the influence of IC components on performance, a measurement model should be proposed that is in accordance with the nature of the underlying variables (in this case, designed conceptual variables).

*2.2 Consequences for empirical research*
After the effort made to take stock of intangible and/or knowledge resources and classify them into different categories, numerous studies have been developed trying to analyze the influence of IC on company performance. Very often, these studies set out from the IC categories previously identified (i.e. HC, SC and RC) in examining the influence of each IC component on performance using "constructs" or "proxy variables" made up of several indicators that try to capture the content of each component.

One of the most influential IC scales that has been used and has inspired many ulterior studies is that suggested by Bontis (1997). This scale encompasses three subscales, one per IC component (i.e. HC, SC and RC)) and each subscale includes not only intangible resources but also different practices that contribute to develop them and different outcomes derived from such resources. For instance, in the case of HC, several indicators can be found related to recruiting, training programs and employee support (i.e. HC-related practices), together with others aimed at measuring whether employees are competent, brilliant, creative, reflective, collaborative or motivated (i.e. HC-related resources), and others showing whether the company is able to achieve its HC-related goals (e.g. getting the most out of employees or business planners being continuously on schedule with their new business development ideas). The same happens with SC, where some of the indicators refer to company practices (such as supporting the development of new ideas and products), others to intangible resources residing in the organization itself (like having innovation supportive systems and procedures, a supportive and comfortable atmosphere, accessible data systems and an organizational structure that promotes employee closeness) and others to SC-related outcomes (such as transaction costs, revenues per employee, transaction time and efficiency). This is also the case for RC, where practice-related indicators refer to continually meeting with customers, getting feedback from them and disseminating such feedback throughout the organization; resource-related ones include understanding targeted market segments and customer profiles and RC-related outcomes encompass customer loyalty, relationship longevity and market share.

Bontis' IC scale exemplifies one of the highest degrees of indicator diversity that we can find in empirical research analyzing the IC-performance linkage, both because each subscale mixes up practices, resources and outcomes, and also because there is a variety of each of them (i.e. different types of practices, resources and outcomes) within each subscale. Other influential scales in the literature also show important degrees of content diversity. For instance, in the case of Youndt *et al.* (2004), each of the subscales they use for human, organizational/structural and social/RC concentrate on a variety of resources or practices. For instance, in the case of HC, employee expertise together with their creativity and innovativeness are considered; while in the case of organizational/SC, indicators regarding knowledge embedded in intellectual property (patents and licenses), manuals and databases, organizational culture, systems and processes are included. In the case of social/RC, the focus moves from knowledge resources to practices, and a variety of them is suggested: employee collaborative and information sharing practices, inter-department idea exchange and knowledge application and partnering with external stakeholders.

Despite the fact that the above scales try to grasp designed or artificially created conceptual variables (in this case, a combination of knowledge and/or intangible resources –

and even outcomes and/or practices – that have been grouped together according to where they reside), common factor measurement models (Bagozzi, 2011) have been mostly applied. This approach suggests a reference to actually existing unobservable variables that give rise to the indicators included in each subscale, as is the case in behavioral research (e.g. MacKenzie *et al.*, 2005). The above involves that high correlations are expected between indicators within the same construct (as they are supposed to derive from the same underlying factor) and that indicators could be dropped out if this were not the case. However, being highly skilled, for instance, does not necessarily involve being highly motivated and having accessible data systems does not necessarily imply having an organizational structure that promotes closeness between employees. Even though this could be the case, there is no real reason to be like this. Instead, such items constitute autonomous and more elementary components of a broader concept (i.e. the corresponding IC category). Thus, when a conceptual variable is viewed as a combination of different elements (i.e. when such elements make up or define the concept as a prescription of how the "ingredients" should be arranged to form a new entity), a common factor model does not apply, but a composite one does (Henseler, 2017).

Beyond this methodological concern, the wide spectrum of elements that could be included in each IC component poses additional problems. Although classifying intangible resources based on where they reside (and thus according to the possibilities for the company to preserve them) is a logical way to proceed for inventorying and descriptive purposes (i.e. for making visible the hidden assets of the firm and present them in a structured way), the categories obtained are too diverse in content to analyze their influence on company performance correctly. With a few exceptions (e.g. Kim *et al.*, 2012; Khalique and Ordóñez de Pablos, 2015; Agostini and Nosella, 2017), most studies analyze the impact of IC on performance with a single construct per IC component. As a result, a selection is made by authors regarding the specific elements to be included within each IC category and, of course, not all authors select the same ones, which affects the comparability of the results obtained.

Moreover, knowledge aside, many intangible resources constitute the focus of other disciplines that analyze them in greater detail (put it the other way around, IC research sources extensively from other domains). That would be the case of employees' values, attitudes, motivation and satisfaction, as well as that of leadership and communication (which pertain to the field of organizational behavior), of organizational structure, networks and organizational culture (that are studied in organizational theory), of people-related management systems, such as development programs or incentive schemes (which belong to the field of human resource management) and of customer- distribution- and image-related issues, such as customer satisfaction, customer loyalty, distribution channels, brands, trademarks and corporate reputation (that belong to the field of marketing). Mixing these issues together with purely knowledge-related resources within the same construct and then analyzing the influence of such construct on performance hinders capturing each aspect properly and makes result interpretation difficult.

Regarding the first problem (i.e. being unable to capture each element properly), this refers to the fact that when very heterogeneous aspects are included within the same construct, each of them tends to be represented by very generic and synthetic indicators, such as "our employees are highly skilled or "our employees are considered the best in our industry" (e.g. Bontis *et al.*, 2000; Subramaniam and Youndt, 2005). Such indicators fail to clarify the specific skills and knowledge that employees need to master, in the same way that indicators such as "our company has efficient and relevant information systems to support business operations" or "our company has a great deal of useful knowledge in documents and databases" (e.g. Kianto *et al.*, 2017; Buenechea-Elberdin *et al.*, 2018), fail to illustrate the type of knowledge that needs to be stored and preserved. Thus, analyses of the IC-performance linkage based on such indicators only provide basic advice about the relevance of hiring bright and skilled

employees or about the need of investing in the right information systems and documenting relevant knowledge. As far as the second problem is concerned (i.e. difficulties in result interpretation), this relies on the fact that dependence relationships could also exist between the elements included in the same construct (especially if practices and outcomes are also included within the same latent variable).

Therefore, to improve the relevance and consistency of IC measurement and considering that many other intangible resources other than knowledge constitute the object of other disciplines that also analyze their influence on performance, the current study proposes to concentrate on what is truly specific of the IC literature and the IC-based view of the firm: knowledge resources residing in individuals, the organization and relationships. Indeed, according to Kianto *et al.* (2018), a necessary condition for gaining relevance lies in a thorough understanding of knowledge. As these authors point out, the IC literature seems to have largely neglected its specific qualities. One of such qualities is *contextuality*. Knowledge is always a contextual phenomenon, with strong local and institutional components. "Even when we are alone, our culture and communities influence us in the form of internalized conceptions, mental models, attitudes, and values" (Kianto *et al.*, 2018, p. 8). Moreover, relevant knowledge is dispersed throughout the organization, as each of the areas of the firm is specialized in a particular knowledge domain (Kianto *et al.*, 2018). This is why pushing general models of IC measurement does not necessarily provide practical results for managers beyond general notions (Schaper, 2016).

### 2.3 Towards a contextual view of IC

A journal paper search carried out by the authors in Scopus on quantitative empirical studies published since 1998 onwards analyzing the IC-performance linkage in specific contexts shows that out of the 318 articles that introduce a contextual approach, 220 of them analyze this relationship in a particular industry or set of industries: for instance, in different types of medium-high or high technology industries (58 papers), banking (40 articles), manufacturing firms (24) and educational institutions (16).

Ownership is the second most frequently considered contextual factor in the IC-performance relationship literature (106 papers), with a special focus on listed companies (83 articles), followed far behind by company size (with 47 papers). In the case of the latter, different combinations of SMEs (i.e. medium enterprises, small firms, micro-firms and nano-businesses) have been studied, with 36 articles devoted to this kind of companies. Country is the fourth contextual factor analyzed, with 36 papers aimed at obtaining specific insights for specific geographical contexts, such as developing or emerging countries (19) and Islamic countries (11). Finally, company age and organizational function are the less studied contextual factors in the literature, with just four papers devoted to start-ups in the first case and three papers devoted to the managerial function and another three to functions as diverse as purchasing, store management and TV reporting within the second group.

Even though the contextual focus of these papers, putting aside the large portion of studies (143 out of 318) based on the VAIC valuation method (Pulic, 2000; Bontis *et al.*, 2007), most of them utilize the same type of IC scales that the ones that have been described in the previous section. Thus, the previously mentioned methodological challenges apply to different extents for such studies aimed at drawing general conclusions on the degree of relevance of IC and its specific components in these contexts, without carrying out any adaptation of their items to the peculiarities of each of them. In other words, these studies mainly do not seek to highlight the specific types of knowledge or intangible items that may be of particular interest in these contexts, but opt mostly to show the general relevance of IC.

Considering the above gap, the current paper tries to develop a measurement scale adapted to the knowledge specificities of the marketing context. The numerous and rapid

changes in the marketing field considerably affect the knowledge resources needed to successfully perform this function. New technologies cause the interaction between individuals and firms to occur through different channels, devices and touchpoints. As a result, new types of data and analytic approaches are emerging, as well as new marketing models, concepts and tools (e.g. Kannan and Li, 2017).

The suggested scale will provide researchers with a more fine-grained instrument that will allow assessing the influence of marketing-specific knowledge resources in the development of marketing capabilities and performance and thus give rise to more tailored recommendations for marketing professionals about how to manage their IC. Marketing managers could also use the scale as a self-assessment tool to diagnose the strengths and weaknesses of the marketing function in terms of knowledge.

## 3. Research design

This section explains the rationale to develop an IC scale for the marketing function and the methods applied to validate and test it. The proposed scale could be applied to any type of company regardless of industry, size and geographical context, provided it has a marketing team (i.e. a group of people who work on marketing-related issues). Of course, certain company characteristics may influence the degree of development of some marketing-specific IC elements and categories, but any firm with a marketing team could use the scale for self-assessment purposes, and researchers could also use it to analyze the influence of marketing-related knowledge resources on organizational capabilities and performance with the appropriate controls. In such studies, firm characteristics could also be treated as moderating factors that may affect the investigated relationships.

### 3.1 Scale development

To develop a measurement scale for marketing-specific IC, the authors set out from the knowledge perspective of IC and thus excluded other intangible resources not related to knowledge. Second, they followed the logic used in mainstream IC research that identified three main IC components in which knowledge resources are examined according to where they reside in the organization (and beyond). Therefore, the traditional three-component classification was considered and adapted to this context, including marketing-specific HC, marketing-specific SC and marketing-specific RC.

In the third step, the authors had to decide which kind of knowledge constituents they should include within each marketing-specific IC category to reflect the knowledge peculiarities of the marketing function. For this purpose, and considering that knowledge is mainly used and leveraged by people (individually or collectively), they had first to identify the main knowledge objects that marketers need to deal with to perform their role (i.e. what do people in the marketing department need to know about). Following Nahapiet and Ghoshal (1998), the distinction was made between explicit or "conscious" knowledge, on the one hand and tacit or "automatic" knowledge, on the other.

Regarding explicit knowledge (i.e. knowledge about facts, concepts and frameworks), and starting with *facts*, the question was made about those entities on which marketers need to know what is going on to perform their job. An examination of mainstream marketing literature gave rise to four knowledge objects within this group: customers, products and/or services, market(s) and the company itself (i.e. the internal context).

The definition of marketing provided the first knowledge object. According to Kotler and Armstrong (2018), "marketing is the process of engaging customers and building profitable customer relationships by creating value for customers and capturing value in return" (p. 53). It follows that *customers* constitute the first knowledge object of the marketing function; to fulfill their mission, marketing professionals must understand the customer.

Building and maintaining profitable customer relationships—the key role of marketing—depends on delivering superior customer value and satisfaction. As this in turn depends on product/service performance that meets customers' expectations (Kotler and Armstrong, 2018), *products and/or services* (i.e. the company's offering) represent the second knowledge object of the marketing function. Marketing department personnel must understand the firm's offering, ultimately contributing to its improvement and/or development.

According also to Kotler and Armstrong, "marketing involves serving a market of final consumers in the face of competitors" (2018, p. 34). Thus, understanding the marketplace constitutes the first step of the marketing process, which implies that the *market* or markets in which the company operates represent the third knowledge object of the marketing function. Marketing professionals must understand the market if they are to successfully differentiate and position the company's offering.

This understanding of the external context must be complemented by knowledge of the firm's *internal context* (i.e. organizational mission and vision, constraints and interdependencies) to ensure that decisions and actions are consistent with the overall setting. As Kotler and Armstrong (2018) point out: "The firm's success depends not only on how well each department performs its work, but also on how well the various departments coordinate their activities" (p. 72). Therefore, company departments need to know each other, as well as how they contribute to the overall company goals and strategy.

Moving now to *concepts and frameworks*, this refers to what is also known as *disciplinary knowledge* (Rossiter, 2001). This constitutes the fifth knowledge object within the explicit or "conscious" knowledge category. In the case of marketing, it consists of "what marketing academics and consultants teach, and marketing managers draw upon in formulating marketing plans" (Rossiter, 2001, p. 9). As well as knowing about the firm's customers, products and/or services, markets and internal context, marketing professionals also need a grasp of marketing-related concepts, frameworks and principles (i.e. prescriptions for managerial action or for applying a particular research technique) to develop and implement successful marketing strategies and address different work situations based on what they know about customers, products and/or services, markets and the firm itself.

The above "information-type" (Kogut and Zander, 1992) or "knowing about" knowledge (Grant, 2010) should be complemented with tacit or "automatic" knowledge. This refers to *know-how* or knowledge about how to do something (in this case, marketing tasks or activities) and "it involves skills that are expressed through performance" (Grant, 2010, p. 163). These personal skills must be distinguished from organizational capabilities, which involve "coordination between organizational members such that they integrate their skills with one another and with a variety of other resources" (Grant, 2010, p. 154). Know-how represents the accumulated practical skill or expertise that allows one to do something smoothly and efficiently (Von Hippel, 1988). This type of knowledge is difficult to transmit: "Knowing how to do something is much like a recipe; there is no substantive content in any of the steps, except for their capacity to produce a desired end. The information is contained in the original listing of ingredients, but the know-how is only imperfectly represented in the description" (Kogut and Zander, 1992, p. 386).

Once marketing knowledge objects were identified, in the last step, different subcategories were proposed within each IC component to capture them, and specific indicators were suggested for each subcategory. To do so, the authors found extant studies that measured the identified knowledge-related constituents, and respective items were adapted to the marketing context.

Except for marketing-specific HC (where a different logic was applied), different subcategories were distinguished based on different types of knowledge "container" within each component. In the case of marketing-specific SC, the distinction was made between IT capital and more traditional forms of organizational memory (as suggested by Bueno *et al.*,

2011), while in the case of RC, four subcategories were suggested based on the internal or external nature of relationships and the actors involved: internal RC at the department level, internal RC at the inter-department level, external RC related to customers and external RC related to other external actors.

In the case of *marketing-specific HC* (where individuals constitute the only knowledge "container"), the subcategories suggested relate to the knowledge objects previously identified, with two exceptions: knowledge regarding the internal context of the firm (which the authors think is mostly embedded in internal relationships between the marketing department and other departments in the company) and disciplinary knowledge, which has been included within a larger subcategory called "educational background and experience" (or "aptitudes" as suggested by Bueno *et al.*, 2011). Thus, consistently with the knowledge-related elements identified in the literature review (Section 2 of this paper), marketing-specific HC encompasses individuals' explicit knowledge or "conscious" knowledge (including factual knowledge about customers, products and/or services and markets, as well as concepts and frameworks—i.e. disciplinary knowledge), individual tacit knowledge or "automatic" knowledge (i.e. know-how or marketing-related skills) and employees' training and experience (which nurtures both "conscious" and "automatic" knowledge).

In the case of *marketing-specific SC*, both subcategories proposed (i.e. IT capital and organizational memory) include different forms of objectified knowledge, while organizational routines (i.e. organizational repositories of collective tacit—or operational—knowledge that constitute the building blocks of organizational capabilities; Becker, 2004) are also part of organizational memory. However, organizational capabilities (in this case, marketing capabilities) are deemed to fall outside the scope of marketing-specific IC. Rather, marketing capabilities (product, pricing, placement/distribution and promotion/communication; Vorhies and Morgan, 2005) are seen to be grounded on the knowledge resources that integrate marketing-specific IC (Kogut and Zander, 1992; Grant, 2010).

Finally, in the case of *marketing-specific RC*, the four proposed categories (i.e. internal RC both at the department and inter-department level and external RC regarding customers and other external actors) will include different pieces of knowledge regarding customers, products and/or services, markets, the internal context of the firm (i.e. factual knowledge) and know-how, depending on the specific knowledge domains to which different types of relationships may be the closest.

### 3.2 Measurement model selection
The type of measurement model to be used is determined by the ontological status of the conceptual variables under study. According to Henseler (2017), a distinction should be drawn between *behavioral* and *designed* conceptual variables. Behavioral conceptual variables refer to human traits, moods, attitudes, behaviors and perceptions, which ". . .exist in nature irrespective of scientific investigation" (Henseler, 2017, p. 178). Conversely, designed conceptual variables are the product of theoretical thinking. They are "constructions" that are theoretically justified, which means that they are human-made "artifacts" (in other words, they are abstractions that do not have an autonomous independent existence in the real world).

In both cases, indicators are chosen to operationalize the unobservable concepts. As usually no single indicator can capture the full meaning of a theoretical concept, multiple indicators are used. These indicators constitute a "construct", "latent variable" or "proxy variable" (Sarstedt *et al.*, 2016), and it often happens that different researchers define different constructs or proxies to represent the same theoretical concept. The correspondence rule (i.e. the measurement model) that links the empirical indicators to a construct depends on the nature of the theoretical concept (Henseler, 2017).

In the case of behavioral conceptual variables, two possibilities exist: reflective measurement (or common factor models) and causal-formative measurement. In the first case, the indicators constitute the manifestation of the unobservable variable (i.e. they have been caused by this unobservable variable). For instance, "anxiety disorder" could give rise to "excessive worrying", "feeling agitated", "restlessness", "fatigue", "difficulty concentrating" and "irritability", among others. In this situation, the correlational pattern of the indicators provides indirect support of the existence of the unobservable variable (i.e. anxiety disorder). In other words, high correlations between indicators are expected (Sarstedt *et al.*, 2016; Henseler, 2017). In the second case (causal-formative measurement), the unobservable variable is caused by the observable variables. For instance, a "healthy condition" could be thought of as the result of "balanced diet", "doing exercise" and "getting enough sleep". In this situation, there is no reason to expect that indicators are correlated (Sarstedt *et al.*, 2016; Henseler, 2017).

In the case of designed conceptual variables (i.e. abstractions or ideas that develop by looking at or thinking about a number of different things), composite measurement constitutes the only possibility (Henseler, 2017). In this case, the indicators or observable variables define or build up the conceptual variable. They do not cause it, but they make it up (i.e. it is a "definitorial" relationship). Thus, in composite measurement, the relationships between the indicators and the conceptual variable are not cause-effect relationships, but rather a prescription of how the ingredients should be arranged to form a new entity (Henseler, 2017). As opposed to "being healthy" (which constitutes an objective reality), IC components only exist as an idea, and different authors may consider different constituents or "ingredients" for the same component (as the Appendix proves it clearly).

Consequently, in composite measurement, the construct is obtained as a linear combination of its indicators without error term, and each indicator enters the linear combination with a specific weight. Such weights can be calculated by means of correlations (mode "A" composites) or by means of multiple regression (mode "B" composites). Mode "A" composites involve bivariate correlations between each indicator and the construct (Sarstedt *et al.*, 2016). In this case, the relationships go from the construct to the indicators and, for this reason, mode "A" composites have been largely confused in the past with reflective measurement or common factor models (Rigdon, 2012, 2016). On the contrary, mode "B" composites involve a multiple ordinary least squares (OLS) regression of the construct or proxy variable on its associated indicators (Sarstedt *et al.*, 2016). Therefore, in this case, the relationships go from the indicators to the construct. This is why mode "B" composites have been largely confused in the past with causal-formative measurement (Rigdon, 2012, 2016).

In fact, due to the definitorial nature of indicators vis-à-vis designed conceptual variables, this is the "natural" way of posing the relationships between indicators and constructs in composite measurement: even though indicators do not cause the conceptual variable, they contribute to define it and, thus, the relationships should go from the indicators to the construct (Sarstedt *et al.*, 2016). However, collinearity among indicators could cause problems in the estimation of indicators' weights in mode "B" composites. Under these circumstances, using mode "A" composites should be considered (Rigdon, 2016; Henseler, 2017).

Most papers on scale development and reporting – see for instance Carpenter (2018) for a recent reference – assume a common factor approach aimed at proving the existence of the conceptual variables under investigation, with common factor analysis at the core of it. Nevertheless, it has been argued that "if there is no actual concept but only a theoretical definition (abstraction or idea), then validation cannot encompass anything more than an assessment of fidelity between the definition and the content of the measurement item"

(Rigdon, 2012, p. 348). In other words, the measures developed in this paper depart from the assumption that traditional factor analysis is not helpful, as it does not apply to the ontological nature of the variables under study.

As defined here, the categories and subcategories of marketing-specific IC clearly involve theoretical constructions or human-made artifacts. They are combinations of items of marketing-related knowledge that are grouped by theme (e.g. customer, product/service, market, etc.) and/or by "container" (people, IT systems, the organization itself and relationships of various kinds). This means that composite measurement is the only kind of measurement model that could be applied (Henseler, 2017), as the indicators or observable variables do not cause the conceptual variable but define or construct it in a "definitorial" relationship.

*3.3 Scale validation and empirical test*
To determine the validity of composites, content validity, face validity and convergent validity must be assessed.

To guarantee content validity, a core development team of three members was created with experts from both IC and marketing backgrounds. One of the team members had an extensive experience in the IC domain, with a track of publications in the most relevant journals of the field; while the second one had also an extensive experience in IC, combined with research and related publications in a variety of marketing and management outlets. Finally, the third team member had a master's degree in marketing and was initiating her academic career. In order to decide the indicators to be included within each marketing-specific IC subcategory, the core development team carried out an iterative process of individual work and collective contrasting that involved ten different rounds before obtaining a version of the scale which each member of the team was satisfied with. Once this version was obtained, the scale was cross-checked with external experts from the marketing department at the corresponding author's university (which did not lead to suggesting any changes).

In order to improve face validity, a pre-test was performed to determine whether the proposed indicators were comprehensible for marketing managers and could be applied in companies of different types. A total of six companies participated in this pre-test and were asked to provide feedback about the scale: three manufacturing companies operating in the food, beverage and wood industries (one of them B2C and the other two serving both end consumers and businesses) and three service companies operating in the editorial, marketing and telecommunication industries, of which two were B2B and the other one served both end consumers and businesses. All the participants in the pretest provided a positive feedback about the scale and did not suggest any change. What is more, several of them highlighted its usefulness as a diagnostic tool for the marketing function, providing a new and relevant perspective.

Finally, as far as convergent validity is concerned, when analyzing composites, this refers to the extent to which the indicators that constitute a construct capture the essence of the conceptual variable they are intended to represent. This involves a redundancy analysis (Hair *et al.*, 2017), where one indicator is included to provide a global or summary sense of the conceptual variable in question, and the correlation between the composite and this summary indicator is then calculated. For adequate convergent validity, that correlation should be 0.707 or higher, representing 50% of the explained variance (Hair *et al.*, 2017).

As collinearity may also create problems when estimating indicators' weights, this must also be assessed. Variance inflation factors (VIF) of 5 or above indicate collinearity between indicators. However, as such issues can also occur at lower VIF values, VIF values should ideally be lower than 3 (Hair *et al.*, 2019). If this is not the case, researchers should consider applying mode A composites (i.e. correlation weights).

A representative survey of Spanish firms was conducted to assess the convergent validity of the proposed scale. This also facilitated diagnosis of the strengths and weaknesses of these companies in terms of marketing-related IC. Spain was chosen to apply the scale because it is the home country of two of the co-authors. Although the designed instrument could be used in any context, the socio-economic and cultural context of the firm could affect the development of marketing-specific IC at the firm level. For instance, the degree of development of technological infrastructures in the country may affect the degree of development of marketing-specific IT capital, while the availability and quality of existing training programs in the marketing domain may affect the degree of development of marketing-specific HC. Likewise, according to Cegarra-Navarro and Sánchez-Polo (2010), "culture shapes assumptions about which knowledge is important, mediates the relationships between individual and organizational levels of knowledge, creates a context for social interaction and shapes the creation and adoption of new knowledge" (Sáenz *et al.*, 2017, p. 133). However, these contextual specificities do not invalidate the measurement instrument as such. Rather, they only inform the reader about potential differences in terms of marketing-specific IC development when companies from different geographical settings are compared.

The above being said, the target population for the empirical test was Spanish manufacturing and service companies with at least 100 employees. This threshold was established to ensure that participating companies had a well-established marketing and sales function. The SABI database (Sistema de Análisis de Balances Ibéricos; System of Iberian Balance Sheet Analysis) was utilized to identify companies that were representative of the study population. The total population comprised 2,346 firms, which were classified into different groups according to different combinations of manufacturing/service, high-tech/low-tech and medium-sized versus large-sized firms.

The above characteristics may cause differences in the degree of development of knowledge resources. For instance, service provision usually involves closer interaction with customers as compared to the delivery of manufactured goods, as well as continuous adaptation to their changing demands (i.e. higher customization degree) (Kianto *et al.*, 2010). The above may increase both the relevance of employees' ability to deal with novel and unexpected situations and that of stored knowledge related to customers' preferences. Second, according to Sáenz *et al.* (2017), high-tech companies deal with more rapidly changing and complex knowledge than low-tech firms, which requires a more skilled and qualified workforce and makes knowledge codification more difficult. Third, as Buenechea-Elberdin (2017) points out, companies with different sizes are expected to show differences in the degree of accumulation of knowledge resources: the larger the company, the greater the possibilities of investing in different types of knowledge assets (e.g. IT capital and highly qualified employees).

Companies were classified into manufacturing/service based on their NACE (*Nomenclature Statistique des Activités Economiques dans la Communauté Européenne*; Statistical Nomenclature of Economic Activities in the European Union) codes (NACE group C corresponds to manufacturing firms, whereas NACE groups H, I, J, K, L, M and N correspond to service companies). The same was done with high-tech and low-tech firms. In the latter case, the OECD (Organization for Economic Co-operation and Development) and Eurostat (the statistical office of the European Union) classification of industries according to their technology intensity was also used. In such classification, R&D intensity (i.e. R&D expenditure/Value added) serves as a criterion to sort out manufacturing industries. Four categories are suggested within the OECD-Eurostat classification: high technology, medium-high technology, medium-low technology and low technology industries. In the case of service sectors (whose classification in terms of technology intensity is only addressed by Eurostat), two groups are suggested (high-tech vs low-tech service industries), based on their share of tertiary educated people (Eurostat, 2020). In this study, firms whose NACE code

corresponded to a medium-high or high technology industry were classified as high-techs, whereas firms whose NACE code corresponded to a medium-low or low technology industry

| Industry | B2B | | B2C | |
|---|---|---|---|---|
| | Freq | (%) | Freq | (%) |
| Food industry | 12 | 3.47 | 16 | 4.62 |
| Manufacture of beverages | | | 2 | 0.58 |
| Textile industry | 1 | 0.29 | 2 | 0.58 |
| Manufacture of clothing | 1 | 0.29 | 2 | 0.58 |
| Leather and footwear industry | 2 | 0.58 | 1 | 0.29 |
| Wood and cork industry, except furniture: basketry and plaiting | 1 | 0.29 | 1 | 0.29 |
| Paper industry | 7 | 2.02 | | |
| Graphic arts and reproduction of recorded media | 4 | 1.16 | | |
| Manufacture of rubber and plastic products | 13 | 3.76 | 1 | 0.29 |
| Manufacture of other non-metallic mineral products | 10 | 2.89 | 1 | 0.29 |
| Metallurgy: manufacture of iron, steel and ferroalloy products | 13 | 3.76 | | |
| Manufacture of metal products, except machinery and equipment | 16 | 4.62 | 1 | 0.29 |
| Manufacture of other transport material | 2 | 0.58 | | |
| Furniture manufacturing | 4 | 1.16 | | |
| Other manufacturing industries | 1 | 0.29 | 2 | 0.58 |
| *Medium-low and low technology manufacturing firms* | *87* | *25.14* | *29* | *8.38* |
| Chemical industry | 7 | 2.02 | 9 | 2.60 |
| Manufacture of pharmaceutical products | 1 | 0.29 | 3 | 0.87 |
| Manufacture of computer, electronic and optical products | 5 | 1.45 | 1 | 0.29 |
| Manufacture of electrical equipment and material | 9 | 2.60 | 2 | 0.58 |
| Manufacture of machinery and equipment | 8 | 2.31 | 5 | 1.45 |
| Manufacture of motor vehicles, trailers and semi-trailers | 7 | 2.02 | 2 | 0.58 |
| Manufacture of other transport material | 3 | 0.87 | | |
| *Medium-high and high technology manufacturing firms* | *40* | *11.56* | *22* | *6.36* |
| Land transport and pipeline | 10 | 2.89 | 15 | 4.34 |
| Maritime and inland waterway transport | 1 | 0.29 | | |
| Accommodation services | 1 | 0.29 | 15 | 4.34 |
| Food and beverage services | 3 | 0.87 | 16 | 4.62 |
| Edition | 1 | 0.29 | 4 | 1.16 |
| Financial services, except insurance and pension funds | 1 | 0.29 | 4 | 1.16 |
| Real estate activities | 1 | 0.29 | 4 | 1.16 |
| Legal and accounting activities | 3 | 0.87 | 1 | 0.29 |
| Activities of head offices, business management consulting activities | 4 | 1.16 | 7 | 2.02 |
| Architectural and engineering technical services; technical tests and analyses | 17 | 4.91 | 1 | 0.29 |
| Advertising and market studies | 11 | 3.18 | 1 | 0.29 |
| Other professional, scientific and technical activities | 4 | 1.16 | 1 | 0.29 |
| Activities of travel agencies, tour operators, reservation services and activities related thereto | 1 | 0.29 | 2 | 0.58 |
| *Medium-low and low technology service firms* | *58* | *16.76* | *71* | *20.52* |
| Motion picture, video and television program, sound recording and music editing activities | | | 3 | 0.87 |
| Programming activities and broadcasting of radio and television | | | 2 | 0.58 |
| Telecommunications | 1 | 0.29 | 1 | 0.29 |
| Programming, consulting and other activities related to computer science | 22 | 6.36 | 3 | 0.87 |
| Information services | 3 | 0.87 | 1 | 0.29 |
| Investigation and development | 3 | 0.87 | | |
| *Medium-high and high technology service firms* | *29* | *8.38* | *10* | *2.89* |
| *Subtotal per type of clients served (B2B vs B2C)* | *214* | *61.85* | *132* | *38.15* |
| *Total* | *346* | | | |

**Table 1.**
Sample composition

were classified as low-techs. As far as company size is concerned, companies with 250 employees or more were classified as large-sized, whereas firms with less than 250 employees, but at least 100, were classified as medium-sized.

Having calculated the sample size needed for a representative study (342 firms), companies in the target population were contacted by phone, and a follow-up system ensured that the relevant proportions of the above groups were preserved (in other words, a stratified sampling procedure was applied so as to guarantee that different proportions of company types according to industry, size and technology level were preserved as in the population). The final sample of 346 companies that answered the emailed or phone survey were assured of total confidentiality. Details of the composition of the sample are provided in Table 1. In the case of the B2B versus B2C distinction, this was done based on companies' responses regarding the type of clients served. If they claimed to serve only corporate customers, they were classified as B2B, whereas if they claimed to serve only end-consumers or both corporate customers and end-consumers, they were classified as B2C. As pointed out by Kotler *et al.* (2006), several characteristics of B2C firms as compared to B2B companies may affect the degree of development of marketing-specific knowledge resources. For instance, the lower complexity of consumer products may facilitate the mastery of their technical characteristics, in the same way as the greater visibility of competitors' offering in B2C industries could make the acquisition of market knowledge much easier.

As can be inferred from Table 1, 178 companies were manufacturing firms, of which 116 were low-techs (87 B2B and 29 B2C) and 62 high-techs (40 B2B and 22 B2C), and 168 companies were service firms, of which 129 were low-techs (58 B2B and 71 B2C) and 39 high-techs (29 B2B and 10 B2C).

Regarding the respondents' profiles, 85.26% held a managerial role in the marketing domain. Several noted that the measurement instrument was a very complete self-assessment tool that enabled them to perform an in depth-analysis of their strengths and weaknesses as a marketing department in a new and highly relevant way, providing further support for the content relevance of the proposed framework.

To analyze convergent validity, structural equation modeling (SEM) based on partial least squares (PLS) was applied, using SmartPLS software version 3.2.8 (Ringle *et al.*, 2015). PLS-based SEM was the appropriate technique for this purpose in light of its composite-based nature. Unlike covariance-based SEM (which involves a common factor approach), PLS-based SEM relies only on composites (Rigdon, 2016).

Finally, descriptive analyses and *T*-tests were carried out to analyze the strengths and weaknesses of Spanish companies in terms of marketing-specific IC and to account for differences between different groups of firms (B2B versus B2C companies, manufacturing versus service firms and high technology versus low technology companies). Differences between large- and medium-sized companies were omitted due to their lower interest.

## 4. Conceptualization, categorization and specification of marketing-specific IC

This section presents the scale developed to assess IC in the marketing function. To that end, the concept of marketing-specific IC is first presented. Following the knowledge view of IC, marketing-specific IC is defined as *all of the available valuable marketing-specific knowledge resources that an organization manages in developing its marketing capabilities and achieving its marketing-related goals.*

This concept complements and extends the market orientation (MO) concept traditionally addressed in the marketing literature. From a market information processing perspective (e.g. Jaworski and Kohli, 1993; Hult *et al.*, 2005), MO refers to the extent to which a company engages in the generation, dissemination and response to market intelligence pertaining to current and future customer needs, competitor strategies and actions, channel requirements

**Figure 1.**
Marketing-specific IC
architecture overview
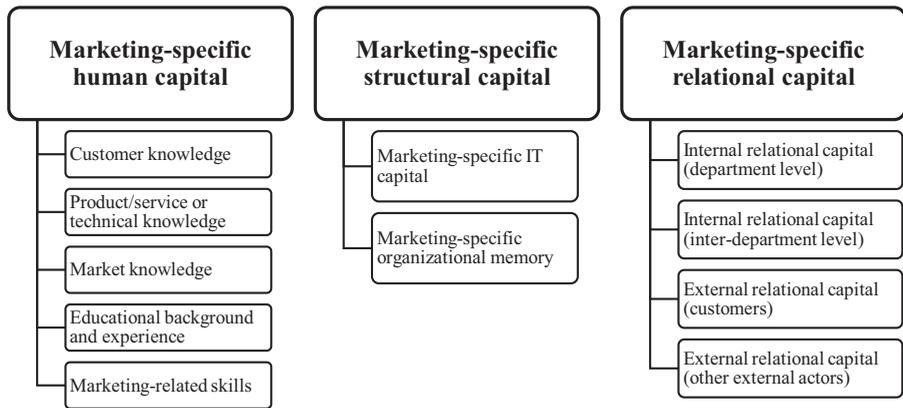
and abilities and the broader business environment (Morgan *et al.*, 2009). It involves customer orientation (i.e. understanding customers' needs and wants), competitor orientation (i.e. understanding rivals' strengths and weaknesses and how they are satisfying customers' needs and wants) and inter-functional coordination (e.g. Narver and Slater, 1990; Hult *et al.*, 2005). Thus, marketing-specific IC could be conceived as the result of a firm's MO: because firms are market-oriented, they are able to generate marketing-specific knowledge resources. The identification and classification of such resources facilitates their subsequent management and monitoring, which increases the chances that MO will lead to superior performance.

In the following, marketing-specific IC categories and subcategories are presented, together with their indicators. Figure 1 provides an overview of the measurement architecture.

*4.1 Marketing-specific human capital*
Marketing-specific HC refers to *all the knowledge residing in marketing and sales people*—in other words, what employees in the marketing department know. Unlike other IC categories involving different subtypes of knowledge containers, HC refers only to employees as "knowledge recipients."

Putting aside knowledge about the internal context of the firm (which the authors think is mostly embedded in internal relationships between the marketing department and other departments in the company), the IC subcategories considered in this domain are: Customer knowledge; product/service knowledge or "technical knowledge" (Behrman and Perreault, 1982; Rapp *et al.*, 2006); market knowledge; educational background (i.e. disciplinary knowledge) and experience (which reinforces other types of knowledge) and marketing-related skills (i.e. know-how). Based on the literature on marketing and sales staff performance, the following specific knowledge items were identified within each subcategory:

*4.1.1 Customer knowledge.* Employees' knowledge about customers enables them to satisfy customer needs more effectively than competitors (Saxe and Weitz, 1982; Rapp *et al.*, 2006). This subcategory comprises six key customer characteristics that people in the marketing function should know about: needs, expectations, satisfaction levels, personality, behavior and circumstances.

*4.1.2 Product/service or technical knowledge.* Referring to employees' knowledge about product specifications, applications and customer use situations (Behrman and Perreault, 1982; Cravens *et al.*, 1993; Rapp *et al.*, 2006), this encompasses five key elements of the company's offering that marketers should know about: product/service specifications; product/service applications and functions; differences from competitors; potential causes of operating failure and the firm's latest product and/or service developments.

*4.1.3 Market knowledge.* This refers to employees' knowledge about the industry in which the company operates (Schillewaert and Ahearne, 2000; Rapp *et al.*, 2006) and comprises four elements: information about industry trends, relevant events and competitors' activities and strategies.

*4.1.4 Educational background and experience.* This refers to employees' formal educational background in marketing, their updated knowledge in this area and their professional experience, both in marketing and sales and in their company's industry. While the first two relate to disciplinary knowledge, experience can reinforce the other three types of knowledge (customer, product/service and market-related), as well as know-how. This sub-category comprises five items encompassing the aspects included in the definition (see Table 2).

*4.1.5 Marketing-related skills.* These are skills considered relevant for marketing and sales professionals—in other words, know-how embedded in individuals. A literature review identified 10 such skills: targeting skills, adaptive skills, problem solving skills, communication skills, planning and organizational skills, expenditure management skills, IT skills, social media management skills, teamwork skills and creativity (e.g. Behrman and Perreault, 1982; Cravens *et al.*, 1993; Sujan *et al.*, 1994; Schillewaert and Ahearne, 2000; Rapp *et al.*, 2006; Piercy *et al.*, 2009; Guesalaga, 2016).

*4.2 Marketing-specific structural capital*

Marketing-specific SC refers to *all marketing-related knowledge residing in a firm's information systems, databases, documents, manuals, routines and procedures, as well as in any other physical and/or digital artifacts.*

Given the proliferation of marketing-oriented IT solutions (e.g. CRM, customer experience management software, customer journey tracking software, social media management software, marketing intelligence software) and the significant possibilities now offered by data analytics, it is useful to distinguish between organizational knowledge generated by computer-based tools and more traditional forms of "organizational memory" (Walsh and Ungson, 1991) that do not involve data processing. Depending on the knowledge resource's origin and container, a distinction can be drawn between marketing-specific IT capital and marketing-specific organizational memory, each encompassing a range of knowledge objects.

*4.2.1 Marketing-specific IT capital.* This subcategory relates to marketing-related knowledge generated by different IT solutions. Based on an analysis of available solutions, 12 relevant knowledge resources can be identified. Of these, 7 relate to customer knowledge (potential new customers, customers' interests and concerns, sentiments and emotions, behavior, journey stage, profitability and existing customer groups and/or segments); 2 relate to product/service-related knowledge (product and/or service performance and opportunities for product/service improvement and/or development); a further 2 relate to market knowledge (about top industry insiders and influencers and market trends) and 1 relates to the internal context (marketing and sales staff performance).

*4.2.2 Marketing-specific organizational memory.* This subcategory includes any stored marketing-related knowledge that employees can access physically and/or digitally. Based on the knowledge management literature (Nelson and Winter, 1982; Frambach, *et al.*, 2003; Argote, 2006; Dalkir, 2011; Murray *et al.*, 2011; O'Dell and Hubert, 2011), seven relevant items were identified. Of these, 1 relates to customer knowledge (relevant and easily accessible

**Table 2.**
Constructs and measures

| Constructs and measures | Item wording | Sources |
|---|---|---|
| *Human capital (HC)* | | |
| Human capital, customer knowledge (HCCK) | To what extent do the following statements apply to your company? (1 = completely disagree, 7 = completely agree) Our marketing and salespeople have a very good knowledge of customers'… | Indicators extracted from Saxe and Weitz (1982), Sheth *et al.* (1999), Homburg *et al.* (2011), Trainor *et al.* (2011) and Mu (2015) |
| HCCK1 | Needs | |
| HCCK2 | Expectations and/or performance requirements | |
| HCCK3 | Satisfaction levels | |
| HCCK4 | Personality | |
| HCCK5 | Behavior | |
| HCCK6 | Circumstances | |
| HCCK7* | In overall, our marketing and salespeople know customers very well | |
| Human capital, technical knowledge (HCTK) | To what extent do the following statements apply to your company? (1 = completely disagree, 7 = completely agree) Our marketing and salespeople: | Scale adapted from Behrman and Perreault (1982), Cravens *et al.* (1993) and Rapp *et al.* (2006) |
| HCTK1 | Know all the specifications of our products and/or services | |
| HCTK2 | Know all the applications and functions of our products and/or services | |
| HCTK3 | Know how our products and/or services differ from those of competitors | |
| HCTK4 | Are able to detect causes of operating failure of our products and/or services | |
| HCTK5 | Keep abreast of our company's product and/or service developments | |
| HCTK6* | Know our products and/or services very well | |
| Human capital, market knowledge (HCMK) | To what extent do the following statements apply to your company? (1 = completely disagree, 7 = completely agree) Our marketing and salespeople: | Scale adapted from Schillewaert and Ahearne (2000) and Rapp *et al.* (2006) |
| HCMK1 | Have a lot of information on industry trends | |
| HCMK2 | Are well-informed about important events in our industry | |
| HCMK3 | Are knowledgeable about our competitors' activities | |
| HCMK4 | Keep abreast of the marketing strategies of our competitors | |
| HCMK5* | Are an excellent source of competitive information | |
| Human capital, educational background and experience (HCEBE) | To what extent do the following statements apply to your company? (1 = completely disagree, 7 = completely agree) Our marketing and salespeople: | Self-developed scale, based on educational background and experience as key ingredients of human capital in traditional IC literature (e.g. Bontis, 1998 and Wang and Chang, 2005) |
| HCEBE1 | Have a Marketing and Sales educational background | |
| HCEBE2 | Have an updated knowledge of new Marketing concepts, tools and techniques (e.g. digital marketing, social media, etc.) | |

*(continued)*

www.

| Constructs and measures | Item wording | Sources |
|---|---|---|
| | Have a high command of the languages needed to perform their work | |
| HCEBE3 | Have an extensive professional experience in the marketing and sales domain | |
| HCEBE4 | Have an extensive professional experience in the industry | |
| HCEBE5 | Have solid educational background and experience to perform their job | |
| HCEBE6* | To what extent do the following statements apply to your company? (1 = completely disagree, | Indicators extracted from Behrman and Perreault |
| Human capital, marketing-related skills (HCMS) | 7 = completely agree) | (1982), Spiro and Weitz (1990), Cravens et al. (1993), |
| | Our marketing and salespeople have excellent… | Sujan et al. (1994), Schillewaert and Ahearne (2000), |
| HCMS01 | Targeting skills (i.e. the ability to focus on the "right" customers or those with the highest potential) | Rapp et al. (2006), Piercy et al. (2009) and Guesalaga |
| HCMS02 | Adaptive skills | (2016) |
| HCMS03 | Problem solving skills | |
| HCMS04 | Communication skills | |
| HCMS05 | Planning and organizational skills | |
| HCMS06 | Expenditure management skills | |
| HCMS07 | IT skills | |
| HCMS08 | Social media management skills (e.g. Twitter, Facebook, Linkedin, Google+, Youtube) | |
| HCMS09 | Teamwork skills | |
| HCMS10 | Creativity | |
| HCMS11* | In overall, our marketing and salespeople have a high command of the skills needed to perform their job | |
| *Structural capital (SC)* | | |
| Structural capital, marketing-specific IT capital (SCIT) | Rate the extent to which data processed by your company's marketing-related IT tools allow you to (1 = not at all, 7 = very satisfactorily): | Self-developed scale, based on knowledge outputs offered by different marketing-related IT solutions existing in the market (e.g. CRM, customer experience |
| SCIT01 | Identify potential new customers | management software, customer journey tracking |
| SCIT02 | Identify your customers' interests and concerns | software, social media management software, |
| SCIT03 | Analyze your customers' sentiments and emotions | marketing intelligence software and the like) |
| SCIT04 | Identify patterns of customer behavior | |
| SCIT05 | Track your customers' journey | |
| SCIT06 | Analyze customers' profitability | |
| SCIT07 | Identify customer groups and/or segments | |
| SCIT08 | Identify top industry insiders and influencers | |
| SCIT09 | Identify market trends | |
| SCIT10 | Analyze product and/or service performance | |
| SCIT11 | Identify opportunities for product/service improvement and/or development | |
| SCIT12 | Analyze the performance of your marketing and sales staff | |
| SCIT13* | In overall, our marketing-related IT tools generate very useful and relevant knowledge | |

(*continued*)

**Table 2.**

**Table 2.**

| Constructs and measures | Item wording | Sources |
|---|---|---|
| Structural capital, marketing-specific organizational memory (SCOM) | To what extent do the following statements apply to your company? (1 = completely disagree, 7 = completely agree) | Self-developed scale, based on knowledge management (KM) general literature (e.g. Nelson and Winter, 1982; Frambach, et al., 2003; Argote, 2006; Dalkir, 2011; Murray et al., 2011; O'Dell and Hubert, 2011) |
| SCOM1 | We have well-established marketing routines and procedures | |
| SCOM2 | We have an updated and easily accessible record (in whatever format: written, video or podcast) of sales and marketing best practices and lessons learned | |
| SCOM3 | We have updated and easily accessible information records on key projects, deals and/or campaigns so employees can reuse them when needed | |
| SCOM4 | We have a complete and updated "who knows what" directory so employees can easily find the right expert to take advice from when needed | |
| SCOM5 | We have updated, relevant and easily accessible information records about customers | |
| SCOM6 | We have updated, relevant and easily accessible information records about competitors | |
| SCOM7 | We have updated and easily accessible information about relevant trends in our markets (e.g. technological trends, regulations, social, political and economic situation) | |
| SCOM8* | In overall, our company has relevant documented knowledge to support its marketing and sales function | |
| *Relational capital (RC)* | | |
| Internal relational capital, department level (IRCD) | Rate the extent (1 = not at all, 7 = very much) to which current patterns of personal interaction within your marketing and sales department(s) (e.g. regular meetings, informal talks and joint work) give rise to: | Self-developed scale based on the definition of social/relational capital by Youndt et al. (2004), on marketing-specific knowledge objects (Rossiter, 2001; Kotler and Armstrong, 2018) and on the specific relationship context (internal: department level) |
| IRCD1 | New and relevant insights about customers | |
| IRCD2 | New and relevant insights about competitors | |
| IRCD3 | New and relevant insights about markets | |
| IRCD4 | New and relevant insights about technological trends | |
| IRCD5 | Shared best practices | |
| IRCD6 | Mutual learning | |
| IRCD7 | Effective ways to diagnose and solve problems | |
| IRCD8 | New perspectives that challenge existing assumptions | |
| IRCD9* | New and relevant knowledge to improve performance | |

(*continued*)

www.

| Constructs and measures | Item wording | Sources |
|---|---|---|
| Internal relational capital, inter-department level (IRCID) | Rate the extent (1 = not at all, 7 = very much) to which current patterns of personal interaction (e.g. regular meetings, informal talks and joint work) between your marketing and sales department(s) and other functions and/or departments give rise to: | Self-developed scale based on the definition of social/relational capital by Youndt *et al.* (2004), on marketing-specific knowledge objects (Rossiter, 2001; Kotler and Armstrong, 2018) and on the specific relationship context (internal: inter-department level) |
| IRCID1 | A truly shared vision | |
| IRCID2 | A good understanding of existing interdependencies (i.e. how our work affects and is affected by other functions and/or departments) | |
| IRCID3 | A shared understanding of problems and challenges | |
| IRCID4 | A shared understanding of system constraints | |
| IRCID5 | A shared understanding of customer needs | |
| IRCID6 | New and relevant insights about how to better integrate and/or coordinate work from different functions and/or departments | |
| IRCID7 | Effective ways to diagnose and solve problems | |
| IRCID8 | New perspectives that challenge existing assumptions | |
| IRCID9* | New and relevant knowledge to improve performance | |
| External relational capital (customers) (ERCC) | Rate the extent (1 = not at all, 7 = very much) to which current patterns of personal interaction with customers (e.g. regular meetings, visits, face-to-face events and joint work) give rise to: | Self-developed scale based on the definition of social/relational capital by Youndt *et al.* (2004), on marketing-specific knowledge objects (Rossiter, 2001; Kotler and Armstrong, 2018) and on the specific relationship context (external: customers) |
| ERCC1 | A better understanding of customers | |
| ERCC2 | A better understanding of how customers use our products and/or services | |
| ERCC3 | The discovery of unsolved problems | |
| ERCC4 | The discovery of improvement opportunities | |
| ERCC5 | New and relevant insights about competitors | |
| ERCC6 | Effective ways to diagnose and solve problems | |
| ERCC7 | New perspectives that challenge existing assumptions | |
| ERCC8* | New and relevant knowledge to improve performance | |
| External relational capital (other external actors) (ERCO) | Rate the extent (1 = not at all, 7 = very much) to which current patterns of personal interaction (e.g. regular meetings, face-to-face events and joint work) between marketing and sales people and other external actors (e.g. regulators, suppliers, researchers, competitors…) give rise to | Self-developed scale based on the definition of social/relational capital by Youndt *et al.* (2004), on marketing-specific knowledge objects (Rossiter, 2001; Kotler and Armstrong, 2018) and on the specific relationship context (external: other external actors) |
| ERCO1 | New and relevant insights about markets | |
| ERCO2 | New and relevant insights about technological trends | |
| ERCO3 | New and relevant insights about such external actors | |
| ERCO4 | The discovery of new opportunities | |
| ERCO5 | The discovery of potential threats | |
| ERCO6 | The discovery of new and relevant practices that could be adopted by the company | |
| ERCO7 | Effective ways to diagnose and solve problems | |
| ERCO8 | New perspectives that challenge existing assumptions | |
| ERCO9* | New and relevant knowledge to improve performance | |

**Note(s):** *Summary indicator for convergent validity assessment

**Table 2.**

information records about customers); 2 relate to market knowledge (relevant and easily accessible records about competitors and market trends); 1 relates to internal context ("who knows what") and 3 relate to know-how (availability of well-established routines and procedures, best practices and lessons learned and information records on key projects, deals and/or campaigns).

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### 4.3 Marketing-specific relational capital

Marketing-specific RC refers to *all marketing-related knowledge generated, transferred and preserved through interpersonal relationships*.

Here, a division has been made between internal and external dimensions of RC, which can be said to yield distinct benefits for the firm from an IC perspective (see for example Yli-Renko *et al.*, 2002; Inkinen *et al.*, 2017). Depending on the actors involved and whether they are internal or external, these relationships can be grouped into four subcategories, each including items related to the different knowledge objects previously identified.

*4.3.1 Internal relational capital (department level).* This refers to the knowledge generated, transferred and preserved through interpersonal relationships within the marketing department. According to Allee (2003), socialization of a department's members and conversations about everyday work are an essential sensemaking mechanism and help to identify knowledge gaps and the resources needed to fill those gaps. In the case of the marketing function, personal interactions between peers can be said to deliver relevant insights about customers (1 item), markets (3 items) and know-how (3 items). More generally, these personal interactions may also prompt new perspectives that challenge existing assumptions about any knowledge object (1 item).

*4.3.2 Internal relational capital (inter-department level).* This refers to knowledge generated, transferred and preserved through interpersonal relationships between marketing personnel and those in other departments or functions. The literature confirms that knowledge sharing and collaboration between the marketing and other functions (e.g. research and development) contributes to firm performance (e.g. Salojärvi *et al.*, 2015). Personal interactions between people from different departments contribute to knowledge of the firm's internal context. In total, four knowledge items are proposed in relation to this knowledge object, referring to shared understanding of the overall firm setting (company vision, interdependencies between departments, problems and challenges and system constraints). Customer knowledge (one item) can also be strengthened through these relationships, as for instance when engineering personnel interact with customers and acquire information of relevance to the marketing department. Know-how-related aspects (two items) include better integration and/or coordination of work from different functions and departments and problem diagnostics and solutions). As in the previous subcategory, one further item is the possibility of generating new perspectives that challenge existing assumptions.

*4.3.3 External relational capital (customers).* This refers to the knowledge generated, transferred and preserved through interpersonal relationships between marketers and customers. Building quality relationships with clients has been extensively discussed in the marketing literature as a key determinant of various dimensions of market performance (e.g. Boles *et al.*, 1997; Walter *et al.*, 2001). From a knowledge perspective, personal interaction with customers can improve customer knowledge (2 items), as well as product/service knowledge (2 items) regarding the discovery of unsolved problems and opportunities for improvement, market knowledge (1 item) in terms of relevant insights about competitors and know-how (1 item) related to effective ways of diagnosing and solving problems. As in the previous subcategories, one further item relates to the generation of new perspectives that challenge existing assumptions.

*4.3.4 External relational capital (other external actors).* This refers to knowledge generated, transferred and preserved through interpersonal relationships between marketers and external actors other than customers. External networks are vital for the discovery of opportunities and testing of new ideas (Lee *et al.*, 2001), and this also applies to the marketing function (e.g. Doyle, 1995; Payne *et al.*, 2005). Personal interactions of this kind can substantially increase knowledge of the market in which the company operates (5 items). They can also provide know-how-related insights for the marketing department (2 items) in terms of new and relevant practices and effective ways of diagnosing and solving problems. As in the other subcategories, one further item has been included regarding the generation of new perspectives that challenge existing assumptions.

## 5. Scale validation

As content and face validity were already verified before the survey research, only convergent validity remained to be tested at this phase. Table 3 shows the correlation between each composite and the corresponding summary indicator (i.e. items marked with an asterisk in Table 2), and Table 4 presents descriptive analyses and VIF values for each indicator. The decision to consider mode A or mode B composites for future analyses depended on the VIF values obtained.

As shown in Table 3, all but one of the correlations are higher than 0.707; the exception is the correlation for *human capital, market knowledge* (HCMK), with a value of 0.692. As this value is extremely close to the threshold, it can be concluded that convergent validity is good enough in all composites. Moreover, as VIF values larger than 3 (see Table 4) were returned for *human capital, customer knowledge* (HCCK)*; human capital, product/service or technical knowledge* (HCTK)*; structural capital, marketing-specific IT capital* (SCIT) *and* all RC subcomponents, a mode A composite was proposed for these subcategories (see Table 3). Notice that differences in the value of *N* (i.e. the number of respondents) in Table 4 are due to the presence of some missing values (i.e. non-responses) in some of the items.

## 6. Marketing-related IC in Spanish firms

Once the marketing-specific IC architecture had been validated, a diagnostic of the participating Spanish firms was carried out. Table 5 reports the descriptive statistics and correlations for the whole sample (in order to obtain a clearer and more synthetic picture, the average score of the items making up each IC subcategory was used). As can be observed, the most developed subcategories of marketing-specific IC are those related to HC, followed by RC and then SC. Regarding HC, product/service or technical knowledge exhibits the highest degree of development (5.75), followed by market knowledge (5.56), marketing skills (5.55)

| Composites | Correlation | Mode |
|---|---|---|
| HCCK | 0.874 | A |
| HCTK | 0.837 | A |
| HCMK | 0.692 | B |
| HCEBE | 0.808 | B |
| HCMS | 0.828 | B |
| SCIT | 0.750 | A |
| SCOM | 0.856 | B |
| IRCD | 0.863 | A |
| IRCID | 0.888 | A |
| ERCC | 0.848 | A |
| ERCO | 0.863 | A |

Table 3.
Correlation between composites and summary indicators

| Indicators | $N$ | Mean | SD | VIF | Indicators | $N$ | Mean | SD | VIF |
|---|---|---|---|---|---|---|---|---|---|
| HCCK1 | 346 | 5.72 | 1.07 | 2.890 | SCOM1 | 345 | 4.86 | 1.42 | 2.038 |
| HCCK2 | 346 | 5.63 | 1.07 | 3.154 | SCOM2 | 345 | 4.04 | 1.70 | 2.471 |
| HCCK3 | 346 | 5.69 | 1.11 | 2.114 | SCOM3 | 344 | 4.81 | 1.56 | 2.129 |
| HCCK4 | 345 | 5.23 | 1.23 | 3.409 | SCOM4 | 345 | 3.96 | 1.66 | 2.040 |
| HCCK5 | 346 | 5.34 | 1.19 | 3.899 | SCOM5 | 341 | 4.85 | 1.46 | 1.761 |
| HCCK6 | 340 | 5.27 | 1.21 | 2.802 | SCOM6 | 346 | 4.17 | 1.57 | 2.677 |
| HCTK1 | 346 | 5.92 | 1.08 | 4.381 | SCOM7 | 346 | 4.42 | 1.58 | 2.405 |
| HCTK2 | 346 | 5.96 | 1.07 | 3.744 | IRCD1 | 346 | 5.37 | 1.19 | 3.890 |
| HCTK3 | 346 | 5.78 | 1.16 | 2.471 | IRCD2 | 346 | 5.14 | 1.25 | 3.609 |
| HCTK4 | 344 | 5.37 | 1.38 | 1.920 | IRCD3 | 346 | 5.23 | 1.18 | 3.268 |
| HCTK5 | 345 | 5.73 | 1.17 | 2.245 | IRCD4 | 344 | 5.09 | 1.26 | 2.341 |
| HCMK1 | 344 | 5.69 | 1.10 | 2.592 | IRCD5 | 346 | 5.12 | 1.27 | 4.706 |
| HCMK2 | 345 | 5.83 | 1.05 | 2.772 | IRCD6 | 345 | 5.23 | 1.36 | 5.307 |
| HCMK3 | 343 | 5.69 | 1.07 | 2.431 | IRCD7 | 345 | 5.19 | 1.30 | 4.396 |
| HCMK4 | 345 | 5.03 | 1.26 | 2.033 | IRCD8 | 343 | 5.00 | 1.32 | 3.523 |
| HCEBE1 | 344 | 5.32 | 1.54 | 2.510 | IRCID1 | 343 | 5.21 | 1.28 | 3.694 |
| HCEBE2 | 346 | 5.30 | 1.51 | 2.305 | IRCID2 | 343 | 5.21 | 1.33 | 4.386 |
| HCEBE3 | 345 | 5.62 | 1.25 | 1.350 | IRCID3 | 344 | 5.20 | 1.27 | 7.416 |
| HCEBE4 | 346 | 5.52 | 1.31 | 2.348 | IRCID4 | 342 | 5.09 | 1.26 | 4.753 |
| HCEBE5 | 346 | 5.74 | 1.21 | 1.799 | IRCID5 | 344 | 5.21 | 1.31 | 4.405 |
| HCMS01 | 344 | 5.50 | 1.13 | 1.922 | IRCID6 | 344 | 5.08 | 1.35 | 5.164 |
| HCMS02 | 344 | 5.76 | 1.05 | 2.407 | IRCID7 | 345 | 5.06 | 1.35 | 5.180 |
| HCMS03 | 345 | 5.84 | 1.04 | 2.585 | IRCID8 | 344 | 4.93 | 1.38 | 3.960 |
| HCMS04 | 344 | 5.78 | 1.08 | 2.478 | ERCC1 | 344 | 5.65 | 1.10 | 3.718 |
| HCMS05 | 344 | 5.49 | 1.19 | 2.758 | ERCC2 | 343 | 5.73 | 1.08 | 4.006 |
| HCMS06 | 340 | 5.41 | 1.21 | 1.863 | ERCC3 | 343 | 5.46 | 1.20 | 3.292 |
| HCMS07 | 342 | 5.32 | 1.28 | 2.163 | ERCC4 | 343 | 5.70 | 1.13 | 4.370 |
| HCMS08 | 343 | 5.06 | 1.56 | 1.745 | ERCC5 | 342 | 5.30 | 1.35 | 2.253 |
| HCMS09 | 345 | 5.83 | 1.20 | 2.512 | ERCC6 | 344 | 5.39 | 1.22 | 3.943 |
| HCMS10 | 339 | 5.55 | 1.22 | 2.263 | ERCC7 | 344 | 5.32 | 1.29 | 3.364 |
| SCIT01 | 345 | 4.70 | 1.53 | 3.253 | ERCO1 | 341 | 5.18 | 1.32 | 4.299 |
| SCIT02 | 344 | 4.74 | 1.52 | 4.491 | ERCO2 | 341 | 5.19 | 1.31 | 3.267 |
| SCIT03 | 344 | 4.11 | 1.67 | 3.449 | ERCO3 | 340 | 5.07 | 1.31 | 4.296 |
| SCIT04 | 341 | 4.50 | 1.58 | 3.816 | ERCO4 | 341 | 5.23 | 1.29 | 4.314 |
| SCIT05 | 343 | 4.49 | 1.63 | 3.346 | ERCO5 | 340 | 5.11 | 1.35 | 4.269 |
| SCIT06 | 344 | 5.19 | 1.44 | 1.690 | ERCO6 | 341 | 5.21 | 1.28 | 3.671 |
| SCIT07 | 340 | 5.13 | 1.42 | 3.091 | ERCO7 | 340 | 4.97 | 1.35 | 5.487 |
| SCIT08 | 341 | 4.33 | 1.70 | 2.265 | ERCO8 | 341 | 4.94 | 1.37 | 5.501 |
| SCIT09 | 344 | 5.01 | 1.52 | 3.456 | | | | | |
| SCIT10 | 344 | 5.04 | 1.43 | 3.127 | | | | | |
| SCIT11 | 344 | 4.93 | 1.45 | 3.580 | | | | | |
| SCIT12 | 342 | 5.04 | 1.42 | 2.259 | | | | | |

**Table 4.**
Descriptive analyses
and VIF values
(indicator level)

and customer knowledge (5.48). In the case of marketing-specific RC, customer capital is the most prominent subcategory (5.51), followed at some distance by other types of RC, with values that are closely bunched (around 5.1 in all cases). Finally, marketing-specific SC is some distance from the other blocks, with values of 4.77 for marketing-specific IT capital and 4.44 for marketing-specific organizational memory.

Having gained this overall picture and because previous studies have shown that IC differs across firms of different types (e.g. Kianto *et al.*, 2010; Buenechea-Elberdin, 2017), $T$-tests were conducted among the previously defined groups of firms to examine whether this also applies to marketing-specific IC (Table 6). The significant differences ($p > 0.10$) between groups are reported below.

| Variable | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. HCCK | 5.48 | 0.97 | | | | | | | | | | |
| 2. HCTK | 5.75 | 1.00 | 0.648** | | | | | | | | | |
| 3. HCMK | 5.56 | 0.94 | 0.532** | 0.523** | | | | | | | | |
| 4. HCEBE | 5.50 | 1.00 | 0.542** | 0.475** | 0.452** | | | | | | | |
| 5. HCMS | 5.55 | 0.89 | 0.570** | 0.524** | 0.549** | 0.684** | | | | | | |
| 6. SCIT | 4.77 | 1.22 | 0.550** | 0.489** | 0.435** | 0.455** | 0.546** | | | | | |
| 7. SCOM | 4.44 | 1.23 | 0.472** | 0.442** | 0.437** | 0.506** | 0.556** | 0.685** | | | | |
| 8. IRCD | 5.17 | 1.07 | 0.491** | 0.469** | 0.463** | 0.402** | 0.591** | 0.492** | 0.551** | | | |
| 9. IRCID | 5.13 | 1.18 | 0.559** | 0.484** | 0.423** | 0.443** | 0.610** | 0.526** | 0.612** | 0.745** | | |
| 10. ERCC | 5.51 | 1.04 | 0.502** | 0.437** | 0.396** | 0.390** | 0.489** | 0.379** | 0.425** | 0.628** | 0.604** | |
| 11. ERCO | 5.12 | 1.17 | 0.429** | 0.344** | 0.392** | 0.438** | 0.501** | 0.492** | 0.476** | 0.548** | 0.529** | 0.555** |

**Note(s):** **Correlation is significant at the 0.01 level (2-tailed)

**Table 5.**
Descriptive statistics and correlations (construct level)

**Table 6.**
*T*-tests among different groups of firms (construct level)

| Variable | B2B; B2C | N | Mean | SD | Sig. of mean difference | Manufacturing = M; Services = S | N | Mean | SD | Sig. of mean difference | High tech = HT; low tech = LT | N | Mean | SD | Sig. of mean difference |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCCK | B2B | 214 | 5.44 | 0.96 | 0.389 | M | 179 | 5.56 | 0.88 | 0.134 | HT | 103 | 5.41 | 0.98 | 0.397 |
|  | B2C | 132 | 5.54 | 0.97 |  | S | 167 | 5.40 | 1.05 |  | LT | 243 | 5.51 | 0.96 |  |
| HCTK | B2B | 214 | 5.65 | 1.04 | *0.012* | M | 179 | 5.71 | 0.96 | 0.402 | HT | 103 | 5.59 | 1.07 | *0.055* |
|  | B2C | 132 | 5.93 | 0.91 |  | S | 167 | 5.80 | 1.04 |  | LT | 243 | 5.82 | 0.97 |  |
| HCMK | B2B | 214 | 5.48 | 0.94 | *0.056* | M | 178 | 5.53 | 0.90 | 0.504 | HT | 103 | 5.62 | 0.92 | 0.469 |
|  | B2C | 131 | 5.68 | 0.93 |  | S | 167 | 5.60 | 0.98 |  | LT | 242 | 5.54 | 0.95 |  |
| HCEBE | B2B | 214 | 5.43 | 0.97 | 0.112 | M | 179 | 5.47 | 0.92 | 0.512 | HT | 103 | 5.66 | 0.89 | *0.053* |
|  | B2C | 132 | 5.61 | 1.05 |  | S | 167 | 5.54 | 1.08 |  | LT | 243 | 5.43 | 1.04 |  |
| HCMS | B2B | 213 | 5.50 | 0.87 | 0.180 | M | 178 | 5.44 | 0.88 | *0.012* | HT | 102 | 5.53 | 0.92 | 0.742 |
|  | B2C | 132 | 5.64 | 0.91 |  | S | 167 | 5.68 | 0.87 |  | LT | 243 | 5.56 | 0.87 |  |
| SCIT | B2B | 214 | 4.65 | 1.25 | *0.016* | M | 178 | 4.73 | 1.21 | 0.543 | HT | 103 | 4.59 | 1.26 | *0.077* |
|  | B2C | 131 | 4.97 | 1.13 |  | S | 167 | 4.81 | 1.22 |  | LT | 242 | 4.84 | 1.19 |  |
| SCOM | B2B | 214 | 4.32 | 1.21 | *0.024* | M | 179 | 4.30 | 1.23 | *0.034* | HT | 103 | 4.38 | 1.22 | 0.534 |
|  | B2C | 132 | 4.63 | 1.25 |  | S | 167 | 4.59 | 1.22 |  | LT | 243 | 4.47 | 1.24 |  |
| IRCD | B2B | 214 | 5.08 | 1.12 | *0.041* | M | 179 | 5.14 | 1.07 | 0.605 | HT | 103 | 5.10 | 1.09 | 0.388 |
|  | B2C | 132 | 5.32 | 0.99 |  | S | 167 | 5.20 | 1.08 |  | LT | 243 | 5.21 | 1.07 |  |
| IRCID | B2B | 214 | 5.01 | 1.22 | *0.018* | M | 179 | 5.08 | 1.20 | 0.502 | HT | 103 | 5.01 | 1.30 | 0.261 |
|  | B2C | 131 | 5.32 | 1.10 |  | S | 166 | 5.17 | 1.16 |  | LT | 242 | 5.18 | 1.13 |  |
| ERCC | B2B | 213 | 5.51 | 1.02 | 0.987 | M | 179 | 5.55 | 0.94 | 0.472 | HT | 102 | 5.58 | 0.96 | 0.397 |
|  | B2C | 131 | 5.51 | 1.06 |  | S | 165 | 5.47 | 1.13 |  | LT | 242 | 5.48 | 1.07 |  |
| ERCO | B2B | 211 | 5.10 | 1.16 | 0.775 | M | 178 | 5.13 | 1.10 | 0.819 | HT | 102 | 5.25 | 1.06 | 0.179 |
|  | B2C | 131 | 5.14 | 1.19 |  | S | 164 | 5.10 | 1.25 |  | LT | 240 | 5.06 | 1.21 |  |

**Note(s):** Values in italics show those cases in which significant differences have been found

The first comparison examined differences between B2B and B2C companies. As marketing differs in B2B and B2C contexts (Kotler *et al.*, 2006), it can be assumed that marketing-specific IC will also differ. The results show that, overall, marketing-specific IC is more developed in B2C than in B2B firms, with significant differences in several IC subcategories. There were differences in HC, where product/service or technical knowledge, as well as market knowledge, were more developed in B2C than in B2B firms (comparative scores were 5.93 vs 5.65 and 5.68 vs 5.48, respectively). Further, all SC subcomponents returned larger scores in B2C companies (4.97 vs 4.65 in the case of marketing-specific IT capital and 4.63 vs 4.32 in the case of other types of organizational memory). Regarding RC, values obtained for internal relational subcomponents were also significantly larger in B2C firms (5.32 vs 5.08 in the case of internal RC at the department level and 5.32 vs 5.01 in the case of internal RC at the inter-department level).

The second comparison looked at the differences between manufacturing and service companies. Although, according to Kianto *et al.* (2010), IC differs between manufacturing and service firms, few differences were found within the marketing context. In relation to HC (marketing-related skills) and SC (marketing-specific organizational memory), service companies returned significantly larger values than manufacturing firms (comparative scores were 5.68 vs 5.44 and 4.59 vs 4.30, respectively).

The third and final comparison explored differences between high-tech and low-tech companies. As others have shown (e.g. Sáenz *et al.*, 2017), IC configurations differ according to company technology intensity, and some significant differences also emerged in the marketing context. In terms of HC, marketing employees in low-tech companies exhibited higher product/service technical knowledge (5.82 vs 5.59), although their educational background and experience was lower than that of employees in high-tech firms (5.66 vs 5.43). Unsurprisingly, the level of marketing-specific IT is significantly higher in high-tech companies (4.84 vs 4.59).

## 7. Discussion
In attempting to develop a model of IC with an improved managerial application, the present study developed and validated a knowledge resources measurement scale, which is specific for the domain of marketing. The marketing function is a useful context in which to develop such a scale in light of its distinctive but universally important organizational role.

Previously, a literature review was carried out aimed at tracing back the conceptualization, categorization and specification of IC and the influence of such issues on empirical research analyzing the IC-performance linkage. An examination of such research revealed several challenges related to IC measurement. These include measurement model misspecification (i.e. using common factor models instead of composites); lack of comparability between studies due to differences in the breadth of content selected by different authors for similar IC categories; usage of very generic and synthetic indicators to grasp each of the multiple elements making up each IC component (which gives rise to very unspecific recommendations) and potential dependency relationships between elements within the same construct (especially when practices, resources and outcomes are mixed up within the same construct).

Therefore, to improve relevance and consistency of IC measurement, the proposition was made to focus on the knowledge view of IC (i.e. to exclude other intangible resources, practices and outcomes) and to deepen into the qualities of knowledge, in particular, into knowledge contextuality. As already argued by Kianto *et al.* (2018), knowledge is always idiosyncratic and organization-specific, right down to the micro level of teams, functions and divisions. The present study adopted this micro-level view to contextualize IC within the marketing function. In the following, theoretical and practical contributions of the research are discussed in detail.

*7.1 Theoretical contributions*

The study introduced a new marketing-specific IC scale in response to recent calls for a contextualized (Kianto *et al.*, 2018) perspective. As compared to previously existing scales, an effort was made to identify those knowledge resources truly specific to the marketing function (i.e. the focal context). While there are studies that examine marketing assets and their relationship to IC as separate constructs (see Pucci *et al.*, 2015), our approach pursues to contextualize IC directly in the marketing context.

Following Nahapiet and Ghoshal (1998), knowledge about *facts* was first considered. The latter involved identifying those entities on which marketers need to know what is going on to perform their job. The following were identified: customers, products and/or services, market(s) and the internal context of the firm. Second, knowledge about *concepts and frameworks* was included (i.e. disciplinary knowledge or knowledge about theories and principles that guide managerial action). Both of them (i.e. facts, on the one hand and concepts and frameworks, on the other) imply explicit or *conscious knowledge*. Finally, *automatic knowledge* (i.e. skills) or knowledge about how to do something (in this case, marketing tasks and activities) was considered.

Once these knowledge objects were identified, specific knowledge resources related to them (i.e. specific "pieces of knowledge") were distributed across the three main groups of knowledge "containers" distinguished in the literature: people (i.e. HC), the organization (i.e. SC) and relationships (i.e. RC). In the case of SC and RC, additional subcategories were created according to more specific knowledge repositories, whereas in the case of HC, the subcategories identified referred to the knowledge objects previously outlined.

The method used to define this scale—identifying relevant knowledge objects in the focal context and how they are distributed among people, the organization and relationships as knowledge "containers"—could also be used to develop more practical IC models for other contexts.

From a methodological perspective, the research carried out also provides a relevant reflection on the type of conceptual variables that IC components represent and the subsequent measurement model that should be applied. Using Rigdon's (2012) expression, IC constitutes one the fields in which it could be said the use of common factor models might have been "oversold".

Moreover, the empirical illustration of the scale offers interesting additional insights into the development of knowledge resources in the marketing function and across companies of different types. From a global perspective, the greater development of human-capital-related subcategories (as compared to RC and SC) suggests that people are the main foundation of IC, and that development of the other dimensions is dependent on employees' knowledge and skills.

One major finding is that the overall level of marketing-related IC is higher among B2C companies (rather than B2B) (see Table 6). Several characteristics of B2C companies (Kotler *et al.*, 2006) could explain the existence of more developed marketing-related IC in these firms as compared to B2B companies. First, consumer products tend to be less complex than industrial ones, which could explain that marketing professionals in B2B firms experience more difficulties to master product/service technical knowledge. Second, in B2C industries, information about competitors' offering is much more visible, which makes the acquisition of market knowledge much easier. Third, the size of the customer base is much larger in B2C companies than in B2B firms, which increases the need for IT-based solutions that help manage relevant information about customers and their transactions in order to identify different patterns of behavior (see also Kannan and Li, 2017). Fourth, marketing actions and campaigns tend to be much more numerous and frequent in B2C companies, which increases the need for building up an "organizational memory" that could facilitate reusing relevant knowledge in future actions. Fifth, unlike in B2B companies (in which quite frequently some

marketing tasks are developed by professionals without a marketing background and from other areas of the company, such as engineering), in B2C firms marketing professionals tend to have a much more focused marketing orientation and background. This increases the need of a strong internal RC that facilitates the transmission of customers' demands and their fulfillment.

Although comparisons of manufacturing and service companies and high-tech and low-tech firms revealed fewer differences in terms of marketing-related knowledge resources, some interesting issues nevertheless emerged (see Table 6). First, as low-tech firms deal with products and services that are less complex than those of high-tech firms, it is easier to know them well, as demonstrated by higher levels of technical knowledge. The higher complexity of knowledge exhibited by high-tech firms (Schilling, 2011) confirms their greater need for highly educated people (Sáenz et al., 2017), and their technology focus means that they use more sophisticated IT tools and solutions. In the case of service firms, the personnel-intensive nature of service provision (Kianto et al., 2010) enhances the role of HC, especially in relation to employee skills and abilities, as the findings confirmed. Additionally, services involve a much higher degree of personalization than manufactured products (Kianto et al., 2010), as reflected in the observed higher levels of organizational memory that help provide each customer with his/her preferred service options on each occasion.

### 7.2 Managerial implications

To paraphrase Dumay (2016), the proposed marketing-specific IC scale is a more suitable, useful and executable tool for practitioners. As several of the participating managers acknowledged, the new scale provides a complete self-assessment tool that enables marketing managers to perform an in depth-analysis of the strengths and weaknesses of their department in terms of knowledge resources. Based on the identified IC categories and their detailed constituents, this collective assessment by marketing personnel can provide a basis for dialog and discussion, as well as for decision-making and action plans to address any relevant gaps. Periodical assessment would help to evaluate development trajectories along different dimensions and how proposed development initiatives might affect different aspects of IC evolution.

### 7.3 Limitations and future research

Like any study, this paper has some limitations. First, as the sample comprised only Spanish firms, findings may have been influenced by national characteristics. While this should not affect the validity of the suggested measurement instrument in itself (see research methods), the level of development of marketing-specific IC categories and constituents is likely to vary across cultural contexts (see, e.g. Sáenz et al., 2017). Put it differently, absolute IC scores may vary depending on the geographical context of the research, but relative differences between different groups of firms (B2B vs B2C companies, high-tech vs low-tech firms or manufacturing vs service companies) are expected to remain unchanged, due to group characteristics that are irrespective of the national context. Nevertheless, future research should test the model in other geographical settings to highlight differences in absolute scores. Second, the data reflect the opinions and perceptions of a single person in each of the surveyed companies. However, it should also be noted that the selected individuals were the most knowledgeable in the present context. Finally, the paper provides only a descriptive illustration of marketing-related IC in the participating companies, with no deeper account of the impact on capability development and performance improvement. Future research should explore how marketing-specific IC and its individual constituents affect the development of different types of capability and performance.

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## Appendix

| Authors | IC definition | IC components |
|---|---|---|
| Brooking (1996) | "Intellectual capital is the term given to the combined intangible assets that make a company to function" (p. 12) | "*Human-centered assets* comprise the collective expertise, creative and problem solving capability, leadership, entrepreneurial and managerial skills embodied by the employees of the organization" (p. 15). They also include psychological characteristics regarding how individuals may perform in given situations, such as in a team or under stress<br>"*Infrastructure assets* are those technologies, methodologies and processes which enable the organization to function. Examples include corporate culture, methodologies for assessing risk, methods of managing a sales force, financial structure, databases of information on the market or customers, communications systems such as e-mail and teleconferencing systems" (p. 16). It refers to the way the above items are used in the organization<br>"*Intellectual property assets* include know-how, trade secrets, copyright, patent and various design rights. They also include trade and service marks" (p. 14)<br>"*Market assets* are the potential an organization has due to market-related intangibles. Examples include various brands, customers and their loyalty, repeat business, backlog, distribution channels, various contracts and agreements such as licensing, franchises and so on" (p. 13) |
| Saint-Onge (1996) | Intellectual capital is the combination of human capital, structural capital, and customer capital | *Human capital* refers to "the capabilities of the individuals required to provide solutions to customers" (p. 10)<br>*Structural capital* consists of "the capabilities of the organization to meet market needs" (p. 10)<br>*Customer capital* refers to "the depth (penetration), width (coverage), attachment (loyalty), and profitability of customers" (p. 10) |

**Table A1.**
The evolution of the intellectual capital – definition and components

(*continued*)

| Authors | IC definition | IC components |
|---|---|---|
| Edvinsson (1997); Edvinsson and Malone (1997) | Intellectual capital corresponds to the difference between market value and book value "It refers to the possession of knowledge, applied experience, organizational technology, customer relationships, and professional skills that provides [a company] with a competitive edge in the market" (Edvinsson, 1997, p. 368) | *Human capital* refers to what is the mind and in the hearts of employees. It is made up of employees' competences and capabilities and of the firms' commitment to support and update them<br>*Structural capital* encompasses process capital and renewal and development:<br>(1) *Process capital* refers to the technological infrastructure of the company<br>(2) *Renewal and development* show how the company is preparing itself for the future<br>*Customer capital* refers to company-customer relationships |
| Stewart (1997) | Intellectual capital is "talent, skills, know-how, know-what, and relationships – and machines that embody them – that can be used to create wealth" (p. 11) "Intellectual capital is knowledge that transforms raw materials and make them more valuable" (p. 12) | *Human capital* refers to the skills and knowledge of employees<br>*Structural capital* includes intellectual property, methodologies, software, documents, and other knowledge artifacts<br>*Customer capital* refers to relationships with customers and suppliers |
| Sveiby (1997) | Intellectual capital is the invisible part of the balance-sheet. | *Employee competence* "includes the capacity of employees to act in a wide variety of situations. People create two kinds of intangible structures, internal and external" (p. 76)<br>"*Internal structure* may include patents, concepts, models and computer and administrative systems. These are created by the employees and are thus generally 'owned' by the organization and adhere to it. Sometimes they can be acquired elsewhere" (p. 76)<br>"Also, the 'culture' or the 'spirit' belongs to the internal structure" (p. 76)<br>"*External structure* may include relationships with customers and suppliers, brand names, trademarks and reputation or 'image'" (p. 76) |
| Bontis (1998) | Intellectual capital is "the stock unit of organizational learning flows" (p. 65) It is the sum of human capital, structural capital and customer capital | *Human capital* refers to the intelligence of organizational members. It includes individual tacit knowledge (i.e. inarticulable skills necessary to perform a function). It is a combination of genetic inheritance, education, experience and attitudes about life and business. It is the source of innovation and strategic renewal<br>*Structural capital* refers to organizational routines. It deals with the mechanisms and structures (e.g. culture, information systems) of the organization that can help support employees in their quest for optimum intellectual performance and therefore overall business performance<br>*Customer capital* refers to market relationships. It also involves knowledge of marketing channels |

(*continued*)

**Table A1.**

| Authors | IC definition | IC components |
|---|---|---|
| Nahapiet and Ghoshal (1998) | Intellectual capital refers to "the knowledge and knowing capability of a social collectivity, such as an organization, intellectual community, or professional practice" (p. 245) | *Individual explicit knowledge* or "conscious" knowledge (i.e. "facts, concepts, and frameworks that can be stored and retrieved from memory or personal records"; p. 247) *Individual tacit knowledge* or "automatic" knowledge. It includes "theoretical and practical knowledge of people and the performance of different kinds of artistic, athletic, or technical skills" (p. 247) *Social explicit knowledge* or "objectified" knowledge. It represents "the shared corpus of knowledge – epitomized, for example, by scientific communities, and often regarded as the most advanced form of knowledge" (p. 247) *Social tacit knowledge* or "collective" knowledge. It represents "the knowledge that is fundamentally embedded in the forms of social and institutional practice and that resides in the tacit experiences and enactment of the collective" (p. 247). This shared knowledge has been defined as "routines" |
| | (*) Social capital is considered a key driver of intellectual capital | *(*) Social capital* is "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network" (p. 243). It encompasses three dimensions: structural (i.e. "the overall pattern of connections between actors"; p. 244), relational (i.e. "the particular relations people have, such as respect and friendship, that influence their behavior"; p. 244), and cognitive (i.e. "those resources providing shared representations, interpretations, and systems of meaning among parties"; p. 244) |
| Roos *et al.* (1998) | "Intellectual capital is made up of al the invisible processes and assets of the company" (p. 30) "Human beings, organizational structure and external relations have been identified as the repositories for intellectual capital" (p. 32) | *Human capital* is the thinking side of intellectual capital. It is not owned by the company, but it is the "soul" of the firm. It includes competence (i.e. the knowledge, skills, talents, and know-how of employees), attitude (which covers the value generated by the behavior of the employees on the workplace), and intellectual agility (i.e. the ability to apply knowledge in very different situations, as well as the ability to innovate and transform ideas in products) *Structural capital* is the non-thinking side of intellectual capital and it is owned by the company. "It includes all databases, organizational charts, process manuals and intellectual property, and anything whose value to the company is higher than its material value" (p. 42). It can be split into three subcomponents: (1) *Organization:* It encompasses infrastructure (i.e. the structural layout of the organization and its intellectual property), processes (i.e. the operations that make the organization tick and that can be transmitted orally or by means of documents and manuals), and culture. Internal networks are also part of this category of capital (2) Relationships (external actors): It includes relationships with customers, suppliers, alliance partners, shareholders, and other stakeholders (3) *Renewal and development value:* It "includes the intangible side of anything and everything that can create value in the future" (p. 51). This refers to "all the items that have been built or created and that will have an impact on future value, but have not manifested that impact yet" (p. 51) |

**Table A1.**

(*continued*)

| Authors | IC definition | IC components |
| --- | --- | --- |
| Sullivan (1999) | "Intellectual capital is knowledge that can be converted into profits" (p. 133) | "*Human capital* consists of a company's individual employees, each of whom has skills, abilities, knowledge, and knowhow" (p. 133)<br>"*Intellectual assets* are created whenever the human capital commits to paper (or any other form of media) any bit of knowledge, know-how, or learning. Once "written", the knowledge is codified and defined" (p. 133)<br>"Examples of intellectual assets include plans, procedures, memos, sketches, drawings, blueprints, and computer programs, to name but a few. Any items in this list that are legally protected are called intellectual property" (p. 133) |
| Meritum Project (2002) | "The terms intangibles and intellectual capital are used to refer to the same concept. Both are applied to non-physical sources of future economic benefits that may or may not appear in corporate financial reports" (p. 61)<br>"Intellectual capital is the combination of the human, organizational and relational resources of an organization" (p. 63) | "*Human capital* is defined as the knowledge that employees take with them when they leave the firm" (p. 63)<br>It includes the knowledge, skills, experience and abilities of people, but also their motivation, satisfaction and loyalty<br>"*Structural capital* is defined as the knowledge that stays within the firm at the end of the working day" (p. 63)<br>"It comprises the organizational routines, procedures, systems, cultures, databases, etc." (p. 63)<br>"*Relational capital* is defined as all resources linked to the external relationships of the firm" (p. 63)<br>It includes relationships with customers, suppliers, investors, creditors or R&D partners<br>It includes knowledge, but also other elements such as image, customer loyalty, customer satisfaction, commercial power, etc. |
| Youndt *et al.* (2004) | "Intellectual capital is the sum of all knowledge an organization is able to leverage in the process of conducting business to gain competitive advantage" (p. 337) | "*Human capital* simply refers to individual employee's knowledge, skills, and abilities" (p. 338)<br>"*Organizational capital* represents institutionalized knowledge and codified experience stored in databases, routines, patents, manuals, structures, and the like" (p. 338)<br>"In essence, organizational capital is the knowledge, skills, and information that stays behind when an organization's people go home at night" (p. 338)<br>"*Social capital* is an intermediary form of intellectual capital consisting of knowledge in groups and networks of people" (p. 338)<br>"More specifically, social capital consists of knowledge resources embedded within, available through, and derived from a network of relationships" (p. 338)<br>"Such relationships are not limited to internal knowledge exchanges among employees, but also extend to linkages with customers, suppliers, alliance partners, and the like" (p. 338) |
| Marr (2006) | Intellectual capital is defined as "non-tangible resources that are attributed to an organization and which support an organization's competencies and therefore contribute to the delivery of the organizational value proposition to its various stakeholders" (p. 42) | "*Human resources* can be thought of as the living and thinking part of the intangible resources" (p. 43)<br>They include the skills and knowledge of employees, as well as know-how in certain fields that are important to the success of the enterprise, plus the aptitudes and attitudes of its staff, and employee loyalty, motivation, flexibility, and experience<br>"*Structural resources* cover a broad range of vital factors" (p. 45)<br>They include the organization's essential operating processes, the way it is structured, its policies, its information flows and the content of its databases, its leadership and management style, its culture and its incentive schemes, as well as intellectual property<br>"*Relational resources* are the relationships that exist between an organization and any outside party, both with key individuals and other organizations" (p. 44)<br>These relationships "can include customers, intermediaries, employees, suppliers, alliance partners, regulators, pressure groups, communities, creditors or investors" (p. 44) |

*(continued)*

**Table A1.**

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| Authors | IC definition | IC components |
|---|---|---|
| Bueno *et al.* (2011) | N.A. | *Human capital* "is made up of that which people and groups know and by the capacity to learn and share this knowledge with others for the benefit of the organization" (p. 15) It includes values and attitudes (feeling of belonging and commitment, self-motivation, satisfaction, sociability and customer orientation, flexibility and adaptability, and creativity), aptitudes (formal education, specialized training, in-house training, experience, and personal development), and capacities or know-how (learning, collaboration, communication, work-life balance, and leadership) *Structural capital* "is the combination of knowledge and intangible assets derived from the processes of action of the organization and which remain in it when people leave" (p. 17). It can be split into: (1) *Technological capital:* It includes the organization's effort in R&D, its technological infrastructure, intellectual and industrial property, and technology watch (2) *Organizational capital:* It includes organizational culture, structure, organizational learning, and processes *Relational capital* "is the combination of knowledge which is incorporated in the organization and people, as a consequence of the value derived from the relationships which they maintain with market agents and with society in general" (p. 23). It can be split into: (1) *Business capital:* It includes relationships with customers; suppliers; shareholders, institutions, and investors; Allies; competitors and institutions for quality improvement and promotion (2) *Social capital:* It includes relationships with public administrations; relationships with the media and corporate image; relationships with institutions for environmental defense; relationships with social organizations and corporate reputation *Entrepreneurship and innovation capital* is made up of innovation outcomes, innovation efforts, and R&D attitudes and capacities |

**Table A1.**

**About the authors**

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