

CONSTRUCTION AND FACTORIAL VALIDITY OF THE INTELLECTUAL CAPITAL QUESTIONNAIRE

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Abstract: This study reports the development and initial validation of the Intellectual Capital Questionnaire (ICQ), which was designed to assess organizational intangibles. The aim of this study was to create groups of items for a questionnaire based on prior theories and existing instruments related to aspects of organizational characteristics. Exploratory and confirmatory factor analysis ($n = 440$) allowed us to validate a 16-item scale with 3 factors, namely, Human Capital, Structural Capital, and Customer Capital. This new questionnaire, presenting good measurement qualities, is an effective tool for measuring organizational knowledge and intangibles in general and provides deeper understanding of organizations' intellectual capital.

Key words: Customer capital, Human capital, Intellectual capital, Organizational psychology, Structural capital.

INTRODUCTION

Although the intellectual capital (IC) construct was first introduced by Galbraith (1973), the concept has been developed during the last decade and various theoretical models have emerged from studies focusing on its characteristics. In line with this, the U.S. Department of Commerce released a new report (Prokopeak, 2008) recognizing the importance of intangibles (e.g., IC) and the measurement relevance of organizational inputs and outputs, such as IC (Prokopeak, 2008). In recent studies, authors such as Kaplan and Norton (2004) suggested that IC corresponds to the techniques, talents, and domain-specific knowledge which are possessed by employees from any given organization. Moreover, associated to IC is the human capital (HC), which is also being considered in recent studies (Youndt & Snell, 2004),

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and refers to the group of intangible resources available to the members of an organization. To be exact, HC includes important organizational dimensions, such as competencies (or techniques), attitudes and motivation, leadership characteristics, as well as intellectual abilities (e.g., innovation and adaptation competencies).

According to several authors (Abeysekera, 2005; Dierickx & Cool, 1989; Henderson & Cockburn, 1994; Hudson, 1993; Klein, Gee, & Jones, 1998; Teece, Pisano, & Shuen, 1997), measurement of intangibles is important in order to assess high quality organizational processes in terms of research and technological development in modern organizations. Therefore, IC is seen as a relevant factor for organizational competition, perseverance and leadership (Youndt & Snell, 2004). Considering this, it is pertinent to find efficient ways of measuring the construct (Juma & Payne, 2004). One of the main problems related to the development of instruments for assessing IC is the difficulty to theoretically conceptualize it (Bontis, Dragonetti, Jacobsen, & Roos, 1999). Furthermore, problems are found in the identification of the components that constitute IC and their measurement (Juma & Payne, 2004).

Despite the proliferation of models of IC in recent decades, there seems to be some consensus with respect to three components of IC: human capital, structural capital, and relational capital (Bontis, 2002; Petty & Guthrie, 2000; Roos, Bainbridge, & Jacobsen, 2001). Other authors (Brooking, 1997; Chen, Zhu, & Yuan, 2004; McElroy, 2002) propose the adoption of new IC dimensions such as technological capital, which involves intellectual property rights, innovation, and technology. Following a review of the literature conducted by Sáez (2006), Table 1 shows all typologies and models proposed to describe IC.

All these models include a Human Capital component, which represents the most important part of IC, as well as knowledge, skills, entrepreneurship, and decision making (Dzinkowski, 2000; Edvinsson, 2000; Hubert, 1996; Stewart, 1999). Structural capital includes four interrelated elements, namely, systems, culture, structure, and strategy (Hubert, 1996). These important elements of structural capital contribute to information sharing, improvement of collective knowledge, and promotion of a reduction in the need of learning, which leads to an increase of human resource productivity (Huang & Hsueh, 2007). Finally, relational capital assumes long-lasting profit and business continuity; it is the main element responsible for management sustainability and refers to the relationship between customers, suppliers, and business partners.

Following the above models, Youndt, Subramaniam, and Snell (2004) proposed that organizational intangibles result from a process of development. In this case, IC follows a particular developmental path (see Figure 1), which starts with human

Table 1. Different IC typologies

Authors	Human capital	Technological capital	Structural capital	Relational capital
Kaplan and Norton (1993)	Learning and growth perspectives		Internal processes	Customer perspectives
Saint-Onge (1996)	Human capital		Structural capital	Customer capital
Brooking (1997)	Individuals	Intellectual property	Infrastructures	Market
Sveiby (1997)	Competences		Internal structure	External structure
Edvinsson (1997)	Human-centered		Processes-centered	Customer-centered
Edvinsson & Malone (1997)	Human capital		Organizational capital	Customer capital
Euroforum (1998)	Human capital		Structural capital	Customer capital
McElroy (2002)	Human capital	Innovation capital	Processes capital	Social capital
Guthrie, Petty, & Yongvanich (2004)	Human capital		Internal capital	External capital
Chen, Zhu, & Yuan (2004)	Human capital	Innovation capital	Structural capital	Customer capital
Joia (2004)	Human capital	Innovation capital	Internal capital	External capital

Note: Adapted from (Sáez, 2006).



Figure 1. Youndt and Cols' (2004) evolutionary model of IC.

capital, followed by social capital, and then by organizational capital.

According to this perspective, human capital is related to the employees' organizational knowledge and learning. It consists of training, knowledge, abilities, and skills that individuals possess in their workplace. The human capital may be obtained internally in the organization by training, or externally by hiring new employees. Social capital is obtained when employees put their knowledge and abilities together by sharing human capital with others. The move to the social capital stage depends on the organizational networks, as well as on the willingness of employees to share their knowledge with others. The development of social capital is dependent on both the structure and culture of the organization. In sum, social capital is associated with various collaborative activities involving human resources, such as knowledge sharing and transfer through strengthening relationships and abolishing communication and personality barriers. The final stage is associated with organizational capital and emerges when individual and collective knowledge become explicit and is stored inside the organizational structure. Organizational capital consists of facilitating the access given to the members of an organization regarding information pertinent to the organization.

Other authors (Adler & Kwon, 2002; Bontis, 1998; Kostova & Roth, 2003; Nahapiet & Ghoshal, 1998) claimed the importance of creating hierarchical models of IC. One of these models was developed by Edvinson and Malone (1997), who described a two-level model of IC. In a first level, they consider human capital (associated with the knowledge created by the organization's human resources), and structural capital (the organizational infrastructures). They, then, divide structural capital in two dimensions at a lower level of IC: organizational capital (knowledge provided by technology systems and processes) and customer capital (relationships between companies and their customers).

Another important hierarchical model of IC was developed by Bontis (1998) where IC (in a higher level) comprises three main dimensions: human capital, structural capital, and customer capital (Figure 2). Human capital can be enhanced by social relations, which can mobilize collaborators to action and, consequently,

improve values and organizational productivity (Adler & Kwon, 2002; Reed, Lubatkin, & Srinivasan, 2006). High levels of human capital can reduce the amount of time and investment to obtain information and solve problems (Burt, 1992). This important dimension of IC involves knowledge necessary to perform tasks, while structural capacity encloses all that comes after working hours, that is, relations with suppliers, clients, local commodities, government, and shareholders. This dimension also integrates the organization as a whole, that is, the organization as a structure, as a culture, as a source of daily professional routines, as a foundation for organizational processes, and as a basis for future projects such as technological innovations (Bontis et al., 1999). Lastly, Bontis (1998) approaches customer capital based on market relations as a dimension that deals mainly with commercial transactions, sales strategies and customer proximity. Bontis (1998) discusses customer capital as the capital that encompasses all external relationships. This is somewhat similar to that referred to as external social capital by sociologists (Bourdieu, 1985; Coleman, 1998) and management theorists (Adler & Kwon, 2002; Youndt et al., 2004). Bontis' model (1998) has a general acceptance in current literature (Atrill, 1998;

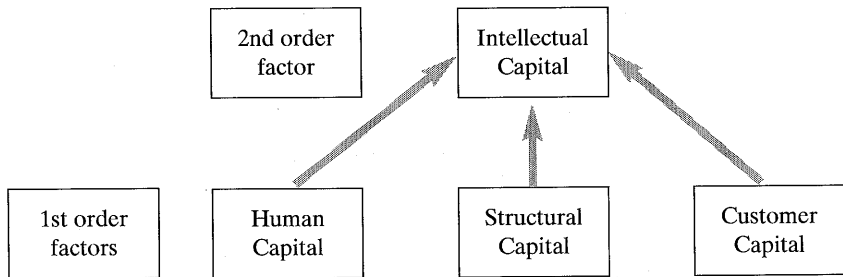


Figure 2. Conceptualization of intellectual capital (Bontis, 1998).

Dzinkowski, 2000; Lynn, 1998). In this model, one must highlight the fact that the structural capital is considered a factor which can best predict the level of performance (Adler & Kwon, 2002; Kostova & Roth, 2003; Youndt & Snell, 2004). Consequently, organizations with a higher level of IC will be those in which the added value services of the organization come from professional knowledge and organizational learning (Bontis, 1998).

The models discussed above entail that organizations with greater success consider management of intangibles as an important strategic tool (Dorweiler & Yakhou, 2005; Swanson, 1999); therefore, companies should acquire or develop human capital (Youndt & Snell, 2004) because IC devaluation may lead to errors in

business success (Caddy, 2002; Kaplan & Norton, 2004). In this sense, financial measures should be complemented with IC measures (Holmen, 2005), considering that IC is correlated with the systems, processes, intellectual richness, organizational culture, and high financial status (Abeysekera, 2003, 2005). To be exact, IC touches several organizational key-areas, such as management of human resources, technology and information centers (Youndt et al., 2004). The construct of IC has advantages in terms of measurement flexibility, as well as use of dynamic models, which allow external comparisons and application to different types of organizations.

To conclude, besides the critiques and a few divergent viewpoints found in the literature reviewed, there is consensus concerning the significant role IC plays in modern organizations. Resulting from this theoretical background, some important IC measures have been developed. There are many IC measurement methods proposed within the IC theory (Bontis, 1998; Brooking, 1997; Chen et al., 2004; Edvinsson, 1997; Edvinsson & Malone, 1997; Guthrie et al., 2004; Joia, 2004; Kaplan & Norton, 1993; McElroy, 2002; Saint-Onge, 1996; Sveiby, 1997). Comparative analyses of different IC measurement methods show that the latter are based on different management paradigms and differ in their IC conceptualization, theoretical background, methodological soundness, number and type of measures used, techniques implemented and other methodological features (Habersam & Piper, 2003).

The present study

The new instrument developed in this study, namely the Intellectual Capital Questionnaire (ICQ), was based on Bontis' (1998) IC scale. The IC scale is one of the most well known measures of IC and consists of 63 affirmative items; responses range from 1 (strongly disagree) to 7 (strongly agree). After a first principal component analysis on the items of the IC scale, the 63 items were reduced to 30 measuring four dimensions of IC: Human Capital (7 items), Customer Capital (7 items), Structural Capital (7 items), and Organizational Performance (9 items). Internal consistency for each of the four dimensions was good, considering that Cronbach's alpha for each dimension was greater than .85. However, despite the good psychometric properties, this scale resulted from an exploratory study conducted with a small sample of 64 MBA students, which is not satisfactory for an initial 63-item scale.

Considering the non-satisfactory factorial validity of the 30-item scale, and in view of the existing different IC theoretical models, we aimed at developing an IC measurement instrument, the ICQ, in order to assess all the constituents that have been discussed in the theoretical introduction and determining the reliability and

factorial validity of this new measure. The language of the ICQ is Portuguese.

Hypotheses

The main aim was to determine whether the ICQ constitutes a valid and reliable measure for the three types of IC most mentioned in the IC literature: human, customer, and structural capital. The second aim was to test the ICQ discriminant validity by comparing different groups of employees. Two hypotheses were formulated: The ICQ will measure the dimensions of Human, Customer and Structural Capital (Hypothesis 1). Higher positions in the organization (e.g., CEOs and top managers) will have a significantly greater mean score in the IC dimensions than the other employees from lower hierarchical positions (Hypothesis 2).

METHOD

Participants

The sample consisted of 440 employees from the Portuguese industrial sector ($n = 82$) and service sector ($n = 358$). The majority of the participants worked in 13 different organizations from the Lisbon area and surroundings (almost 80%). The other 20% were from Porto (two organizations) and Aveiro (one organization). In each organization, four groups of staff were represented. Specifically, the first group consisted of individuals responsible for the organization (chief executive officers, presidents, and company owners); the second group consisted of individuals engaged in top managerial roles (organizational directors); the third group consisted of staff engaged in middle-management roles (heads of departments, supervisors), and the fourth group contained personnel engaged in technical managerial roles (computing, marketing, personnel, financing, etc.). These four groups will be referred to as CEOs, top managers, middle managers, and technical managers throughout this paper. The number of respondents in each group was as follows: CEOs ($n = 46$), Top managers ($n = 74$), Middle managers ($n = 82$), and Technical managers ($n = 238$). Almost half of the sample (47.7%) consisted of employees that exerted leadership functions.

Information on demographic and work-related characteristics of the participants (age, gender, length of service in the organization and organizational attainments) were also collected (Table 2).

Table 2. Demographic and work-related characteristics of the participants

Groups	N	Mean age (SD)	Male participants n (%)	Years of service
CEOs	46	55.97 (8.83)	32 (68.80)	30.61
Top managers	74	42.54 (9.71)	90 (82.10)	20.05
Middle managers	82	40.30 (12.12)	92 (89.60)	15.51
Technical managers	238	36.74 (8.69)	139 (58.40)	12.77

Scale construction

Based on the conceptualization of the IC construct presented, which includes dimensions of Human, Customer and Structural Capital (Adler & Kwon, 2002; Atrill, 1998; Bontis, 1998; Dzinkowski, 2000; Lynn, 1998; Youth & Snell, 2004) and prior to the ICQ construction, 60 items were developed. Each one of them was submitted to a rigorous examination by a research team of three university professors from a Department of Psychology (researchers in the domains of psychological evaluation and organizational assessment). These experts assessed content validity, that is, the original items were analyzed and rated on content appropriateness and clarity by using a 7-point scale that ranged from 1 (not at all appropriate or not clear) to 7 (very appropriate or clear). Items containing ratings between 1 and 5 were dropped. Thus, 8 items were deleted, and 3 new items were added on the basis of these results.

A series of principal component analyses led to further dropping of items. Factors loaded by only one or two items were deleted (Hakstian, Rogers, & Cattell, 1982). As a result, the exploratory factor analysis was rerun until the factors related to the hypothesized model were clearly abstracted. Furthermore, and in accordance with Ford, MacCallum, and Tait (1986), we deleted items with loadings greater than .40 on two or more factors. This statistical treatment allowed us to develop a 16-item questionnaire with three subscales, which measured three dimensions of IC. Items 1, 4, 7, 10 and 13 measure customer capital; items 2, 5, 8, 11, 14 and 16 measure structural capital, and items 3, 6, 9, 12 and 15 measure human capital. All items consisted of affirmative items with responses given on a 7-point Likert-type scale, ranging from 1 (totally disagree) to 7 (totally agree). The ICQ also contains negatively phrased items that need recoding, namely, items 3, 6, 9, 12 and 15.

A principal component analysis was then applied to the 16 items of the ICQ. This analysis showed a KMO (Kaiser-Meyer-Olkin measure of sampling adequacy) value of .816, which indicated that there was an adequate amount of common factor variance that could be analysed. By using Kaiser's criterion, only three factors with eigenvalues greater than one were retained, which explained 57.07% of the total

Table 3. *Intellectual Capital Questionnaire factorial structure*

Items	Factor 1	Factor 2	Factor 3
Factor 1: Customer capital			
1. There is a preoccupation to solve customer problems in little time (CC1)	.839		
4. There is a preoccupation to support customers with quality (CC2)	.823		
13. There is a preoccupation to know customers better (CC3)	.810		
10. In my company there is a preoccupation with receiving customer satisfaction feedback (CC4)	.786		
7. My company is customer-oriented (CC5)	.774		
Factor 2: Structural capital			
2. Sales have increased (SC1)		.875	
5. Sale profits have increased (SC2)		.825	
8. The company's profits have increased recently (SC3)		.824	
11. My company has research & development support structures (SC4)		.649	
16. New products are well accepted in the market (SC5)		.629	
14. There is a return from all money invested (SC6)		.612	
Factor 3: Human capital			
9. There are bad relations between workers (HC1)			.782
6. There are usually conflicts between leaders and workers (HC2)			.690
3. Turn-over is greater than in other companies (HC3)			.673
12. There are problems when somebody resigns from the company (HC4)			.547
15. People have difficulties in measuring the consequences derived from their decisions (HC5)			.468
Eigenvalues	4.665	2.539	1.931
% of explained variance	29.157	15.868	12.072
Cronbach's alpha	.88	.85	.65

variance. Moreover, the varimax rotation provided a good approximation to a simple interpretable structure (see Table 3). Factor loadings less than .40 have been deleted. All the items of the IC representing organizational aspects related to customer relations had noticeably high loadings on the first factor. What all these items have in common are concerns related to customers. Consequently, Factor 1 represents customer capital. The second factor had loadings from all the items related with sales, profit, support structures, and new product generation. Considering this set of items as a whole, we interpreted Factor 2 as representing structural capital. The third factor had loadings from items whose content taps topics such as relations between workers, colleagues, and leadership. This factor also represents other aspects of human resource such as turnover, communication patterns, and decision making. Considering all of these items as a whole, we interpreted Factor 3 as representing human capital.

RESULTS

Confirmatory factor analysis

The model, which resulted from the exploratory factor analysis, was tested by using a confirmatory factor analysis on the data from the same participants. The adequacy of the data fit was determined by using the AMOS 6.0 (Arbuckle, 2005) software. Accordingly, we tried to confirm the model obtained with estimation procedures of maximum likelihood, by using the following fit indices: chi-square, root mean square error of approximation (RMSEA), normed fit index (NFI), comparative fit index (CFI), and incremental fit index (IFI). NFI, CFI and IFI values close to value 1 indicate a very good statistical fit (Bentler, 1990). Values of RMSEA equal or less than .08 indicate a good fit (Browne & Cudeck, 1993). The confirmatory factor analysis showed a good fit of the 3-factor model, $\chi^2(28, N = 440) = 49, p < .001$, RMSEA = .059, NFI = .940, CFI = .962, and IFI = .963. Following Colquitt (2001) procedures, alternative models consisting of two factors and one factor were tested; both were rejected because of their inadequate fit indexes (see Table 4).

Table 4. Fit indices for the confirmatory factor analysis

	χ^2	<i>df</i>	Sig.	χ^2/df	NFI	IFI	CFI	RMSEA
Three-factor	49.0	28	.000	15.280	.940	.963	.962	.059
Two-factor	814.4	104	.000	7.831	.613	.645	.639	.142
One-factor	1031.3	105	.000	9.822	.510	.537	.529	.162

Descriptive statistics and item total intercorrelations

Determining internal consistency and, particularly, testing whether any of the chosen items in the ICQ were problematic, we computed the correlations between response to a particular item and the sum of the responses to the items from each subscale (item total intercorrelations) was required. According to Table 5, the item total intercorrelation ranged from .62 to .80 for the Structural Capital subscale, .79 to .85 for the Customer Capital subscale, and .57 to .77 for the Human Capital subscale. Consequently, all the correlation coefficients were greater than .50. Thus, an application of the Kolmogorov-Smirnov test was used and allowed us to verify that scale scores were normally distributed for each of the three subscales.

Table 5. Descriptive statistics and item total intercorrelations of the ICQ subscales

Items	<i>M</i>	<i>SD</i>	Customer Capital	Structural Capital	Human Capital
Customer Capital subscale					
CC1	5.36	1.25	.850**	.311**	-.193**
CC2	5.53	1.18	.834**	.339**	-.175**
CC3	5.39	1.11	.815**	.284**	-.250**
CC4	5.40	1.30	.815**	.239**	-.097
CC5	5.43	1.21	.787**	.239**	-.211**
Structural Capital subscale					
SC1	4.95	1.27	.131*	.800*	-.058
SC2	4.99	1.18	.227**	.748**	-.014
SC3	5.09	1.34	.058	.708**	-.131*
SC4	4.46	1.50	.306**	.691**	-.042
SC5	5.12	1.02	.419**	.617**	-.198**
SC6	5.39	1.09	.351**	.647**	-.053
Human Capital subscale					
HC1	3.12	1.03	-.204**	-.076	.770**
HC2	3.80	1.64	-.303**	-.141**	.728**
HC3	2.98	1.52	-.009	-.042	.650**
HC4	2.88	1.46	-.022	.026	.612**
HC5	3.78	1.39	-.192**	-.140**	.575**

Note: See Table 3 for the meaning of the abbreviations of the items. * $p < .05$; ** $p < .01$.

Reliability

The internal consistency reliability coefficient (Cronbach's alpha) was computed for each one of the three subscales. Specifically, for Customer Capital, Structural Capital, and Human Capital, Cronbach's alpha was .88, .85, .65, respectively. According to Nunnally (1978), reliabilities of .70 (or greater) are sufficient. Nevertheless and despite the lower alpha value of the Human Capital subscale (but close to .70), these values were considered to show that the three subscales were adequately reliable.

Differences between employee groups

To determine discriminant validity, we tested the ICQ capacity to differentiate employees from different organizational hierarchical positions. A 4(group) x 3(subscale mean scores) MANOVA was applied to the mean scores of the items loading each of the three subscales. The results showed that only the interaction between group and customer capital was significant, Pillai's trace = .16, $F(3, 440) = 13.39$, $p < .01$, $\omega^2 = .11$. Post hoc tests showed (see Table 6) that technical managers had a much lower mean score on Customer Capital subscale ($M = 5.09$, $SD = .07$)

Table 6. Descriptive statistics for the three factors of the ICQ as a function of the groups of employees

	Customer Capital		Structural Capital		Human Capital	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
CEOs	5.95	.17	5.03	.16	3.59	.18
Top managers	5.80	.13	5.00	.12	3.03	.13
Middle managers	5.59	.12	4.96	.11	3.41	.12
Technical managers	5.09	.07	5.02	.07	3.31	.08

than CEOs ($M = 5.95$, $SD = .17$), top managers ($M = 5.80$, $SD = .13$), and middle managers ($M = 5.59$, $SD = .12$). No significant differences in the post hoc tests were found for Structural Capital and Human Capital subscales.

DISCUSSION

According to our results, Hypothesis 1 was verified and Hypothesis 2 was partially confirmed. As regards *Hypothesis 1*, the confirmatory factor analysis confirmed the 3-factor structure that corresponded to the three dimensions of IC the ICQ was intended to measure, namely, the customer capital, the structural capital, and the human capital. The three IC subscales of ICQ measuring the respective dimensions of IC showed adequate internal consistency. The Cronbach's alphas were lower than those reported by Bontis (1998) who had found the following alphas: .92, .92, and .93 for the Human Capital, Customer capital, and Structural Capital, respectively. In our case, only the Human Capital subscale had low alpha value when compared with those of Bontis (1998). This finding means that human capital is a dimension that is difficult to measure (Bontis, 1988). In future studies, other items should be added (see Cortina, 1993) in order to improve the reliability of the Human Capital subscale. Nevertheless, we may conclude that the scale appears suitable for use in Portuguese companies in terms of scale internal consistency reliability.

As for the results of the confirmatory factor analysis of the ICQ items, it was evident that the ICQ structure resembles Bontis' (1998) model (see also Tseng & Goo, 2005; Youdt & Snell, 2004). In fact, the data of the present study did not have a factor structure corresponding to the four dimensions argued by Tseng and Goo (2005) which include human, organizational, innovation, and relationship capital. Furthermore, the well known model of Youth and Snell (2004), which also posits three dimensions of IC was not supported, because neither social capital nor organizational capital fit with the factors of the ICQ. Moreover, in accordance with our results, we were able to show that human capital was an integral part of IC as many

models assume (Bontis, 1998; Tseng & Goo, 2005; Youdt & Snell, 2004).

Evidently, the three-factor structure that was found in the present study can explain how intangibles work in organizations and can help managers assess their IC. Compared to Bontis' (1998) IC scale, this new instrument seems to highlight the three important dimensions of IC with few items. Moreover, this scale was tested with a greater sample and with employees from both the services and the industry sectors. Bontis' (1998) IC scale was only filled in by 64 MBA students, some of which mentioned that they were not currently close to any organization in order to respond to some of the responses (Bontis, 1998). Therefore, the ecological validity of the ICQ is higher than Bontis' (1998) IC scale.

Finally, from the point of view of IC literature (Kamathy, 2007) there are several advantages the ICQ can contribute, because it easily and quickly gives a picture of the current situation in an organization as regards IC. The advantages can be summarized as follows: (a) the ICQ subscales may reflect the actual worth of the organizations; (b) the ICQ gives insight about management practices and organizational interventions; (c) the ICQ provides useful information for potential investors and may enhance shareholders' values; lastly, (d) "what gets measured, gets managed". Companies gain competitive advantages and superior productivity through acquiring, holding and using intangible strategic assets, which promote strong financial performance (Amit & Schomaker, 1993). Measuring IC helps organizational diagnosis and, consequently, its results have several managerial implications (Wu, Tsai, Cheng, & Lai, 2006).

Overall, the results associated to *Hypothesis 2* showed that different employee groups differed in one component of IC, namely customer capital, but in other aspects, they were remarkably similar. The technical managers had a lower level of customer capital, when compared with other employees groups. This finding suggests that the higher the hierarchical position in the organization, the higher the customer relevance for the overall organizational management is. In fact, the literature (Payne & Webber, 2006; Salanova, Agut, & Pieró, 2005) suggested that new companies have to be customer-oriented if they want to survive in a competitive market. CEOs as well as top and middle managers have to define rules and approaches to continuously attract customers. They are aware of how important it is to be close to the customers, to know their wishes and concerns and, inclusively, to understand what they're looking for. On the other hand, the technical managers have no great preoccupation with their customer relations, since their main task is to execute internal organization procedures.

The present study should be complemented with benchmarking studies through the adoption of meaningful references that help firms increase their operations

efficiently in accordance with IC scores. This data provides one of the most powerful tools for communication between managers and employees. The ICQ is an important strategic tool that can help companies adopt new practices for enhancing their performances and productivity (Wu et al., 2006).

Conclusion

The psychometric data of the present study can be considered as part of an initial validation study of the ICQ carried out on a representative sample of employees in organizations. Our results allow us to present the ICQ that can be used to test hypotheses related to interventions and their expected outcomes in a larger scale research project. To further test the discriminant validity of the ICQ future research should focus on other kinds of organizational contexts (e.g., banks, insurance companies, hospitals, and universities). Additionally, it is important to highlight Habersan and Piper's (2007) considerations regarding a comprehensive presentation of IC, where quantitative and qualitative approaches in understanding IC are important in order to better access its different dimensions and extent of transparency.

Despite the lack of consensus related to a single IC model, ICQ seems to be appropriate to measure intangibles in organizational contexts. It is important that it is further used to measure important organizational aspects identified in the literature, such as performance, productivity, and efficiency (Caddy, 2002; Kaplan & Norton, 2004; Stabell & Fjeldstad, 1998).

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