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A multidimensional view of intellectual capital: the impact on organizational performance

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Abstract

Purpose – The purpose of this paper is to empirically explore intellectual capital (IC) from a multidimensional perspective and its relationship with organizational performance (OP) within Iranian public listed companies.

Design/methodology/approach – Survey data from Chief Financial Officers in 128 companies within Tehran Stock Exchange were collected and analyzed using partial least squares regressions.

Findings – The findings suggest that organizational culture plays a significant role in developing human capital and structural capital while trust is a major determinant of all the IC components, namely human, structural, relational, and social capital. The results also confirm that the investment in human, structural, and relational capital could potentially bring about OP improvement in Iranian public listed companies.

Practical implications – A synthesis of various sub-elements of IC supports executives in detecting, capturing, and assessing the different kinds of knowledge resources which must be taken into consideration individually for maximizing OP. Such multidimensional and comprehensive conceptualization of IC would assist organizations to remedy the inefficiency in the exploitation of IC and thereby providing a robust system in order to capture and measure IC more effectively.

Originality/value – This study combines literature on IC across diverse academic fields. The multidimensional conceptualization of IC with four sub-dimensions (i.e. human, structural, relational, and social capital) as well as supplementing two antecedent constructs (trust and organizational culture) offer a more systematic manner to synthesize several knowledge-based drivers toward performance which have not been addressed simultaneously in a comprehensive framework.

Keywords Iran, Organizational culture, Trust, Tehran Stock Exchange, Intellectual capital, Organizational performance

Paper type Research paper

1. Introduction

In today’s hypercompetitive world, the adage that “knowledge is power” has a growing importance than ever before (Rechberg and Syed, 2013). Organizations’ knowledge-based resources are becoming increasingly pivotal to their successful operation in parallel with the development of the global economy toward being more information-intensive. This implies that what an organization “knows” could be more critical than what it owns (Siegel, 2004). According to the survey of corporate evolution with the 200 largest US manufacturing companies throughout the twentieth century, only 28 firms have continued to exist (Louçã and Mendonça, 2002). In the twenty-first century, organizations encounter a more fierce and dynamic context that is described by the combination of globalization, advanced technology, shortened product-life cycles, and network partnerships (Cardinal, 2001; Hayes et al., 2005). Nowadays, under the new world economy, the prevailing managerial practices or techniques with conventional
strategic orientation such as cost cutting, benchmarking, reengineering and so forth
are regarded inefficient and inadequate to reap competitive advantage (Teece, 2007).
This posed an important question – what do firms do to survive? In this respect, one
important research line devotes considerable attention to intangible resources which
are embedded in know-how and knowledge of manpower, databases, information
technology, operating processes, customer relationship, brand, trust, and cultures

Concerning the considerable significance of intellectual capital (IC) and knowledge
resources as a cornerstone of competitive advantage, a variety of different academic
fields have suggested the significant association between IC and performance (Grindley
and Teece, 1997; Menor et al., 2007; Subramaniam and Youndt, 2005). However,
managers still experience ineffectiveness in the utilization of IC (Edvinsson and
Sullivan, 1996), according to an analysis carried out by the Economist and Accenture
in 2003 (Molnar, 2004). Approximately all the managers throughout the world who
participated in that study asserted that handling intangible resources are considered
as the fundamental driver toward competitive advantage. Nonetheless, the absolute
majority of the managers, i.e. 95 percent of the 120, contended that there is a total lack
of a robust system in their companies to measure IC and the generated performance.
This issue in turn underlines this fact that theory and research seem to be ineffective
so far in addressing how to determine the nature of IC inside firms and the influence
of the intangible resources on quantifiable performances.

In effect, a precise conceptualization and definition of IC still remains disputable
despite the general consensus about the importance of IC as a cornerstone for value
creation. For instance, Hudson (1993) narrows the scope of the concept to merely
individual knowledge. Some scholars, among others, Brooking (1996) and Roos and
Roos (1997) incorporate organizational relationships, infrastructure, culture, routine,
and intellectual property into the conceptualization of IC as well. Given the above
discussion and concerning the foregoing problems, unlike previous studies, this study
aims to conceptualize the multidimensional and complex concept of IC by incorporating
social capital as the fourth element along with other three general elements (i.e. human
capital, structural capital, and relational capital) and their effects on organizational
performance (OP). In addition, two antecedent variables or so-called drivers of IC,
i.e. organizational culture and trust, which originally proposed by Bontis (1999) as
one of the seminal conceptualizations of IC framework, are empirically examined to
determine their effect on the aforementioned four individual components of IC which in
turn could provide a more robust and comprehensive conceptualization of IC.

2. Literature review and hypothesis development
2.1 Multidimensional view of IC
Several perspectives on IC have been put forward by scholars during last two decades.
For example, Edvinsson and Malone (1997) offered one of the seminal definitions within
the IC literature (Kim et al., 2012; Petrash, 1996; Yang and Lin, 2009). From their viewpoint,
IC falls into three components, namely human capital, structural (organizational) capital,
and relational (customer) capital. From a broader vantage point, Table I summarizes
definitions, examples of operationalization, and related literature spanning the diverse fields.

A careful analysis of the literature reveals some noteworthy facts. First, a
comprehensive review underlines this fact that a multidimensional view of IC must be
taken into consideration to parsimoniously capture the concept. Such multidimensional
perspective could be explained by two antecedents or so-called drivers of IC (adopted
<table>
<thead>
<tr>
<th>Field</th>
<th>Definition</th>
<th>Human</th>
<th>Structural Operationalization</th>
<th>Social Operationalization</th>
<th>Relational Operationalization</th>
<th>Literature</th>
</tr>
</thead>
<tbody>
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<td>Economics</td>
<td>Knowledge, intangible resources, intellectual property</td>
<td>Quality of labor, intelligence, skills, education level, faculties supported by federal grant</td>
<td>Patents, trade secrets, trademarks, copyrights, etc.</td>
<td></td>
<td></td>
<td>Augier and Teece (2005), Lev (2001), Schankerman (1998), Zucker et al. (1998)</td>
</tr>
<tr>
<td>Information system</td>
<td>Knowledge, technology</td>
<td>Individual knowledge, skills</td>
<td>Information system, intranet, database, routines, documents, problem solution sets</td>
<td>Organizational culture, team culture</td>
<td></td>
<td>Alavi and Leidner (2001), Griffith et al. (2003), Schultae and Leidner (2002)</td>
</tr>
<tr>
<td>Finance/accounting</td>
<td>Market assets, human-centered assets, intellectual property assets, infrastructure assets, brand equity</td>
<td>Employees’ knowledge, expertise, problem-solving capability, creativity</td>
<td></td>
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<td>Source: Lee (2011)</td>
</tr>
</tbody>
</table>
from one of the most famous IC conceptualizations suggested by Bontis, 1999), namely organizational culture and trust in addition to four dimensions: first, human capital (HIC), which is defined as the collective knowledge of manpower such as experience, skills, and know-how; second, structural capital (SIC), which refers to the particular knowledge possessed by an organization including information system, processes, and data; third, social capital (SOIC), which can be described as the knowledge stem from informal interactions among the organizational members; and fourth, relational capital (RIC), which represents the knowledge embedded in relationships with external parties such as customers, suppliers, and so forth. The aforesaid IC elements highlight the fact that there are distinctive knowledge-based assets which organizations could accumulate and exploit via human resources, structures, cultures, and external partners (Lee, 2011; Berry, 2004; Stewart and Ruckdeschel, 1998; Subramaniam and Youndt, 2005).

Second, there is a varied range of frequency which each of the components of IC is taken into consideration. HIC and SIC are considered most commonly, whereas SOIC and RIC are addressed to a lesser extent in the literature. The majority of the disciplines have concentrated on aspects of highest interest of their own. For instance, the area of accounting and finance has mainly focussed on measurable resources merely, whereas overlooking the factor of social capital. The marketing major has primarily addressed customer relationships as the most significant intangible resources to gain profit. Information system area has devoted further consideration to structural capital regarding the forms of IT system in order to support knowledge management. Integrated with the first point, this finding indicates the necessity of incorporating all the specific arguments from each discipline. Otherwise, the incoherent and sporadic disputes on IC would fail to provide an exhaustive and real insight to practitioners concerning how to detect and leverage critical knowledge-based assets of an organization (Marr, 2012). Recently, there are some empirical researches which carry a more precise view to the analysis of IC by acknowledging the multidimensional perspective (Lee, 2011; Menor et al., 2007; Subramaniam and Youndt, 2005). However, the investigated concepts are delineated and measured rather generally so that more comprehensive argument regarding how to manage a variety of intellectual resources becomes complicated.

In order to satisfy the desire for exploring a multidimensional view of IC, this study largely barrows the conceptualization introduced by Bontis (1999). In his model, two antecedent constructs, i.e. trust and culture, play a leading role as two supporting drivers behind the other IC dimensions. According to Bontis, the phenomenon of IC could be fallen into three components. As illustrated in Figure 1, each is reflected based on its essence, scope, parameter, and codification difficulty. Moreover, Bontis refers to the role of two drivers, namely “trust” and “culture” which can be considered for their influence on IC development. More recently, there are some other scholars in the context of IC which advocate the absolute necessity for establishing a framework with regard to the antecedent conditions which are essential for the efficient IC development (Bratianu et al., 2011; Isaac et al., 2009; O’Brien et al., 2010). In addition to two aforementioned antecedent constructs, three general components of IC (HIC, SIC, and RIC) are supplemented by the fourth dimension, i.e. social capital in order to address IC from multidimensional view as discussed in the previous section. The following sections explain the antecedent variables and the four components of IC.

2.2 Organizational culture and IC
IC forms the basis for the wealth and prosperity of organizations. The ample evidence indicated that knowledge-related resources and capabilities bring about radical success

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in many companies; Buckman Laboratory being one of the best examples (Buckman, 2004). Although the knowledge economy is advocating for changing the way organizations operate, success lies with successful cultural change. According to Baker (2002), there is a strong indication that the cause of failure when instituting changes (such as TQM and reengineering) is linked to the failure in instigating cultural changes within an organization (CSC Index, 1994; Kotter and Heskett, 1992; Pascale and Goss, 1993). For instance, despite the fact that acquiring brilliant human resources and laying emphasis on workforce learning increase the value of organization, reaping the advantages of IC is only viable when organization is able to translate the knowledge of human resources into reusable and sustained functions. This needs a culture through which staff commitment is established, learning is promoted, knowledge sharing is encouraged, and organizational members are participated in decision making (Weston et al., 2007).

Bratianu et al. (2011) posited that the culture of an organization acts as a very strong glue, as it brings together the intelligence of an individual and their respective core values in instigating a culture of excellence. Organizational leaders who are visionaries always understood the salient role of corporate cultures, thus they worked hard toward the development of a strong and inspirational culture in their respective organizations. Acting as organizational glue, organizational culture is salient in the construction of IC that has the potential to innovate (Bratianu et al., 2011).

Literature regarding “organizational culture” is numerous, and there are many authors who prioritize culture as being more than merely the basis of an organization’s success (Nazari et al., 2009). The theory that is mentioned by Flamholtz is in line with this notion, due to the fact that culture is thought of as “an area of essential organizational development, a strategic keystone for a successful company.” Meanwhile, Copeland (2001) regards company culture as imperative to the construction of IC. In the same vein, literature regarding organizational effectiveness is more and more focussed upon the role of organizational culture toward motivating and maximizing the potential of their respective intellectual assets (Yu and Yanfei, 2008). Mouritsen (2003) argued that culture is pivotal to either effective organizational modification or augmenting the value of IC. Petty and Guthrie (2000) advocates that organizational culture is crucial toward
corporate success, and is capable of increasing IC within that organization. This is especially true in today’s organization, due to the fact that fluctuating environments and k-economy characterizes it, and this requires an impregnable organizational culture in the context of prescribing commonality and behavioral patterns that will inevitably hoard intangible resources that might have been present in the past.

Different kinds of corporate culture would have different impacts on IC. For example, supportive or flexible dominant cultural type could play a big part in fostering the IC (Bontis et al., 2000). In the context of the current study and as stated earlier, control values embody predictability, stability, formality, rigidity, and conformity. More specifically, the rationality of culture is reflective toward an orientation prone to efficiency and profit. Heavy emphasis is paid upon factors such as planning, productivity, and clarity of the goal. The hierarchical nature of the culture is highly reflective of bureaucracy and its inherent stability, emphasizing roles, rules, and regulations. In summary, the types of culture that are linked to control promote rigid control of operations, highly structured channels of communications, and limited flows of information (Burns and Stalker, 1961). Moreover, the value of flexibility generally refers to spontaneity, changes, openness, adaptability, and responsiveness. In particular, the culture of development is heavily reliant upon adaptability and the readiness to realize growth, innovation, and creativity. The culture of a group is reflective of cohesion, teamwork, and morale as conduits that are meant to foster development, empowerment, and unwavering commitment to human resources. In a nutshell, the types of culture that are linked to flexibility are supportive of loose and informal controls, open and lateral channels of communication, and organizational free flow of information (Burns and Stalker, 1961). Such flexible dominant cultural type, as opposed to control culture, is more appropriate in today’s knowledge-based environment and is an important driver and enabler to support and guide the IC management and development (Lynn, 1998).

Accordingly, the following hypotheses are put forwarded based on the forgoing discussion derived from the literature:

**H1.** There is an association between the organizational culture and the IC.

**H1a.** There is an association between the organizational culture and the human capital.

**H1b.** There is an association between the organizational culture and the structural capital.

**H1c.** There is an association between the organizational culture and the relational capital.

**H1d.** There is an association between the organizational culture and the social capital.

### 2.3 Trust and IC

Leaders in companies devote considerable time and energy endeavoring to establish trust with a variety of stakeholders either within organization (among employees, among managers, and employees) or outside the organization (e.g. customers, suppliers, investors, competitors, affiliates, etc.) (Pirson and Malhotra, 2008). Are these efforts paying off? Employees who place less trust in a company are supposed to be less loyal, less motivated, and less productive. This also extends to customers, as customers who are wary of a breach of trust will more than likely approach a competitor in order to safeguard their own interest. In a client-supplier relationship, the lack of trust will
increase the need for resources devoted to contract enforcement and monitoring, which inevitably increases the cost of transactions. Organizations that do not manage to keep the trust of their respective investor will more than likely go under. This highlights the importance of the trust of stakeholders in organizations.

Stakeholders are commonly divided into groups, with each group having their own requirements and perspective on things, and managing this different interest group can be quite a challenge. This factor propels the factor of trust in IC to the forefront of issues that needs to be dealt with delicately. Trust, whether between business and customers, business and supplier, between customers, or internal trust, is deemed crucial to the expansion of a business’s IC (Isaac et al., 2010). Bontis (1999) defines trust as sacred toward both inter- and intra-organizational cooperation. For instance, social capital depends on trust for many researchers. The relationships, communities, cooperation, and mutual commitment that characterize social capital could not exist without a reasonable level of trust. Without some foundation of trust, social capital cannot develop.

Lin (2007) managed to successfully demonstrate that trust between coworkers is an important mediating variable, due to the fact that it is directly correlated to their respective willingness to share tacit knowledge, while Gainey and Klaas (2003) discovered the fact that trust is an important antecedent variable regarding client satisfaction in the context of outsourcing training and development, mostly owing to the presence of tacit knowledge. The lack of trust between coworkers will discourage the sharing of privately held knowledge, rendering it difficult to either create or exploit. This seems to signify that the management of IC is heavily reliant upon trust (Isaac et al., 2010). Ståhle and Hong (2002), in their discussion regarding dynamic IC, organizational change, and self-renewal, seems to suggest that trust is crucial not only between employees, but it is also significant between managers and their respective employers. Trust is also one of the significant considerations that are taken into account in the context of a learning organization (Ferguson-Amores et al., 2005), especially on the construction of network with the express purpose of knowledge sharing (Pöyhönen and Smedlund, 2004), while also integrating employees into the decision-making process (Pučėtaitė and Lämsä, 2008). The findings suggest that trust is imperative toward the promotion and creation of IC, due to the fact that the act of sharing tacit knowledge is critical toward the development of IC. Horwitz et al. (2003, p. 27) discusses the practices inside knowledge intensive organizations, and it was suggested that trust is rather significant among other factors, and came up with the conclusion that: “These would turn tacit knowledge within employees to explicit knowledge, which is important in building both intellectual and social capital, accessible by others in the organization.” The lack of trust between coworkers will curtail the sharing of private knowledge, which is indicative of the fact that the creation and subsequent development of IC is incumbent upon great levels of trust. With the foregoing arguments in mind, the following hypotheses are suggested:

**H2.** The greater the level of trust, the higher is the level of IC.

**H2a.** The greater the level of trust, the higher is the level of human capital.

**H2b.** The greater the level of trust, the higher is the level of structural capital.

**H2c.** The greater the level of trust, the higher is the level of relational capital.

**H2d.** The greater the level of trust, the higher is the level of social capital.
2.4 IC and OP

There are two different roots in knowledge studies according to management literature (Marr et al., 2003, 2004). The first is embedded in the information, knowledge, and its implication to knowledge management while the second embodies knowledge as an asset manageable which would potentially bring about superior OP. The resource-based view (RBV) of the firm argues that sustained competitive advantage derives from the firm’s resources and capabilities – bundles of tangible and intangible assets, including management skill, organizational processes and routines, and the information and knowledge it controls (Barney, 2001). Nowadays, organizations should be held accountable for their performance for a broad range of clients, from the board of managers to staff, and investors to market regulators (Tayles et al., 2007). Thus, companies should assure clients that their performance exceeds all known expectations. Many scholars asserted that investment in IC leads to an improvement in economic performance (Bollen et al., 2005; Bontis, 1998; Sharabati et al., 2010). This performance is defined by the profitability of operations, which represents a surplus or a margin that is captured due to the difference between the cost of income or production. Along the same lines, several researchers observed that IC significantly affects a firm’s financial performance (Chen et al., 2005; Clarke et al., 2011; Riahi-Belkaoui, 2003; Tan et al., 2007; Youndt et al., 2004). Profitability, which expresses the ability of invested capital in profiteering, is reflective of this financial performance. Based on the RBV, Chen et al. (2005) is adamant that IC forms an invaluable resource for a firm’s competitive advantage, mainly effective on a firm’s financial performance. Moreover, Youndt et al. (2004) posits that knowledge-based firms success rates are higher compared to their non-knowledge counterparts, due to the fact that they are more competitive.

To sum up, IC encourages value creation, which in turn leads to superior performance in today’s knowledge-based economy (Tayles et al., 2007). In line with the study conducted by Bollen et al. (2005) and Chen et al. (2005), a direct correlation between the efficiency of ICs and the performance of a firm is expected to be present. Also, according to Edvinsson and Malone (1997), IC affects firm performance and, hence, IC should be managed. Thus, the hypotheses are set forth as follows:

\[ H3. \text{ The higher the level of IC, the higher is the OP levels.} \]
\[ H3a. \text{ The higher the level of human capital, the higher is the OP level.} \]
\[ H3b. \text{ The higher the level of structural capital, the higher is the OP level.} \]
\[ H3c. \text{ The higher the level of relational capital, the higher is the OP level.} \]
\[ H3d. \text{ The higher the level of social capital, the higher is the OP level.} \]

3. Theoretical framework

The theoretical framework of this study is mainly underpinned by “RBV” which is originally derived from RBV. Based on the central premise of RBV, organizations would be able to outperform others organizations and gain an edge over competitors if they possess valuable, rare, inimitable, and non-substitutable resources and capabilities (Barney, 1991).

As discussed earlier, there has been little empirical work regarding the conditions necessary for the effective IC development within firms. According to Isaac et al. (2009), far too little attention has been paid to internal organizational structures, systems,
practices, and characteristics that enable organizations to develop such invaluable assets. What antecedent conditions are necessary for taking full advantage of firm’s most critical resources? Hence, in addition to the RBV, this study particularly employs contingency theory and tries to explicate the association between two contextual factors, namely organizational culture and trust (as the two antecedent drivers) and IC. According to the selection type contingency theory, it can be assumed that organization’s IC adapts to fit contextual or contingency factors (Huang et al., 2010; Selto et al., 1995) that in turn brings about optimization between structural variables (dimensions of IC) and contingency variables. Although culture and trust classified under the IC conceptualization proposed by Bontis (1999), this study draw upon the contingency theory to justify the effect of these two antecedent variables on the other main IC components. This is in harmony with Bontis (1999) IC conceptualization as he refers to trust and culture as two drivers which are able to foster the IC development procedure. More recently, there are some other scholars in the context of IC which advocate the necessity for expanding a framework involving the antecedent conditions which are vital for the efficient IC development (Cabrita and Bontis, 2008; Nazari et al., 2009; Isaac et al., 2009; O’Brien et al., 2010; Bratianu et al., 2011). Hence, with the foregoing discussion in mind, this study proposes a theoretical model, illustrated as the research framework in Figure 2.

4. Research method
4.1 Survey procedure and sample
The economy of Iran is diversified economy with over 40 industries directly involved in the Tehran Stock Exchange (TSE). As recommended by Bontis (1998), a multi-industry sample would allow an investigation of inter-industry effects and potentially broaden

![Figure 2. Theoretical model](image-url)
the study’s generalization. As Subramaniam and Youndt (2005) also asserted, the inclusion of a broad group of organizations and industries is intended to maximize variation of the variables and also to increase the generalizability of the findings. Besides, worldwide studies of multi-industry markets in varying phases of development enable economists to gain valuable insights into momentous institutional features that may yield positive and desired result (Foster and Kharazi, 2008). Accordingly, the population of this research encompasses all companies listed in the TSE in the year 2012. According to the “Tehran Stock Exchange Monthly Report” (as of May 2012), 339 companies with a combined market capitalization of US$104.21 billion were listed on TSE. Because of the limitation of the number of population and also taking full advantage of a multi-industry sample, as just outlined above, no sampling was exploited in order to provide a more valid, reliable and comprehensive study and accordingly the whole population was selected as research sample. TSE companies were selected since the vast majority of them are medium to large-sized firms which plausibly possess greater resource available for investment in knowledge-based resources and also actively engaged in more innovative/strategic management accounting control systems. Besides, all the companies’ information and data are accessible widely in TSE. The mailing list provided by TSE directory has complete information on the public listed companies across Iran such as managing directors’ names, addresses, contact numbers, types of product/service manufactured/provided, number of employees, years of establishment, and so forth.

The data collection procedure for the current study was carried out via the structured questionnaire. The questionnaire supplemented by a cover letter posted to the Chief Financial Officers (CFOs) of the sampled 339 companies within TSE in Iran. A total of 136 questionnaires were received, from which 128 usable questionnaires with a response rate of 37.7 percent were eventually coded and used for the purpose of data analysis.

Despite the limitations of the “key informant” methodology (Phillips, 1981; Kumar et al., 1993), the current study employed this data collection approach due to the fact that the organizational characteristics we intend to measure, namely IC, organizational culture, and trust are only known by the top management level within organizations (John and Reve, 1982). Moreover, IC scholars highly recommended the highest level of managers as the key informant for the purpose of capturing and measuring IC given the strategic nature of such knowledge-based asset (Bontis, 1998; Bukh et al., 2001; do Rosário Cabrita and Vaz, 2005). Therefore, the CFOs were selected because of their high level of proficiency in the subject-matter as well as their hands-on experience with strategic issues. They are also knowledgeable about and directly involved in the administrative processes and procedures of company by providing a variety of services to the business such as financial planning and analysis and helping to shape overall strategy and direction. Using such top managers as the respondents is an effort to lessen bias as it is believed that CEO/CFO are the best persons in the companies to provide the best opinion on some of the most important and strategic issues related to IC, trust, and company performance.

Following Cavana et al. (2001), the pre-testing process was conducted through three separate phases. First, the face validity of the questionnaire was assessed through involving PhD candidates in participating in the pre-test survey to gauge their reaction on the items and gets their feedback regarding understanding, wording, and general structure of the questionnaire. In the second phase, content validity was evaluated by judgment of a panel of expert. Given an acceptable face and content validity
4.2 Variables and measurement

The current study relies on perceptual measures in capturing all the data for the analysis. Perceptual measures predominantly used in the performance measurement and IC literature. The subjective approach based on executive’s perceptions has been used extensively in empirical studies (do Rosário Cabrita and Vaz, 2005). As a matter of fact, ad hoc questions are more appropriate for capturing features closer to a particular and internal phenomenon, in comparison with proxies extracted from databases (Delgado, 2011). Further, Venkatraman and Ramanujam (1986) and Dess and Robinson (1984) have found consistency between executive’s perceptions of performance and objective measures. As Kannan and Aulbur (2004) pointed out, perceptual measures are commonly utilized for the purpose of investigating the organizational factors which influence manpower performance, human capital improvement, and firm performance. They indicated that the use of perceptual measures is the most prevalent measurement method used by more than 100 IC-related studies. According to Sharabati et al. (2010), the both perceptual and objective measures of knowledge-based resources are broadly equivalent despite the fact that objective measures tend to be less prone to respondent bias. They argued that the use of perceptual measures for both exogenous and endogenous constructs would tend to balance out any over-inflated response bias. Hence, employing proxy metrics and perceptual measures is more prevalent in the IC literature since measurement of intellectual properties objectively is somewhat complicated (Kannan and Aulbur, 2004). In the same vein, trust and culture are always measured qualitatively based on perception respondents (Bhimani, 2003; Henri, 2006; Huff and Kelley, 2005; Isaac et al., 2010; Lai et al., 2009) since these variables are pertinent to people’s emotional and cognitive evaluation of their lives.

**OP – dependent variable.** This research views firm performance as effectiveness – the extent to which the unit is successful in achieving its planned targets or stated objectives (Mia and Clarke, 1999; Steers, 1977). OP was measured using an instrument developed by Gupta and Govindarajan (1984) and Govindarajan (1988), which measures OP along multiple dimensions, rather than on any single dimension. CFOs were asked to rate their firm’s performance on the specified dimensions, using a seven-point Likert scale with anchors “significantly below average” and “significantly above average.” This instrument has been widely used in prior research (Bisbe and Otley, 2004; Chenhall and

<table>
<thead>
<tr>
<th>Variables</th>
<th>No. of items</th>
<th>Cronbach’s α</th>
</tr>
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<tbody>
<tr>
<td>Organizational culture</td>
<td>16</td>
<td>0.723</td>
</tr>
<tr>
<td>Trust</td>
<td>8</td>
<td>0.898</td>
</tr>
<tr>
<td>Human capital (HIC)</td>
<td>6</td>
<td>0.839</td>
</tr>
<tr>
<td>Structural capital (SIC)</td>
<td>9</td>
<td>0.892</td>
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<tr>
<td>Relational capital (RIC)</td>
<td>10</td>
<td>0.945</td>
</tr>
<tr>
<td>Social capital (SOIC)</td>
<td>4</td>
<td>0.939</td>
</tr>
<tr>
<td>Organizational performance (OP)</td>
<td>10</td>
<td>0.963</td>
</tr>
</tbody>
</table>

*Table II. Results of the pilot study*
Langfield-Smith, 1998; Govindarajan and Fisher, 1990; Hoque, 2004), and was developed in the context of management accounting studies.

**IC – independent variable.** For capturing IC level, the respondents asked to express their opinions regarding a total of 29 questions adopting from Tayles et al. (2007) as well as Subramaniam and Youndt (2005), which originally drew upon the core ideas of the social structure literature (Burt, 1992), on a range of questions in relation to their organization’s emphasis on IC. Specifically, IC was sub-divided into four components, namely human, structural, relational, and social capital which were operationalized with six, nine, ten, and four items, respectively. All the four independent variables quantified by using the seven-point Likert scale (1 = strongly disagree, 4 = neither disagree nor agree, 7 = strongly agree).

**Organizational culture – antecedent variable.** Organizational culture was captured according to the competing-values approach. This instrument was validated by previous studies (Zammuto and Krakower, 1991). Beside, some recent accounting researchers have applied the instrument in their studies (Bhimani, 2003; Henri, 2006). The instrument asked key informants (CFOs) to distribute 100 scores among the four ideal cultural types along each of the following four dimensions of culture: institutional character; institutional leader; institutional cohesion; and, institutional emphases. For each dimension, respondents should distribute 100 points among four sentences where organization A represents “group culture,” organization B refers to “developmental culture,” organization C refers to “hierarchical culture,” and organization D refers to “rational culture.”

Following Henri (2006), this research aims to identify the particular position of each company according to the control/flexibility continuum, that is to say dominant type. Cultural-type score and a value score determine the dominant-type score. In this regard, first, the cultural-type score is computed for each culture through averaging the ratings obtained on the four dimensions. For each organization, the sum of the four cultural types equals 100. Second, the value score is calculated for the control/flexibility continuum in the following manner:

\[
\text{Flexibility-value score} = (\text{Group-culture score} + \text{developmental-culture score})
\]

\[
\text{Control-value score} = (\text{hierarchical-culture score} + \text{rational-culture score})
\]

Finally, the dominant-type score is achieved through deducting the control-values score from the flexibility values score. Concerning that the flexibility and control-value scores are the extremes of a competing-values continuum, a difference score specify the particular position of each company on this continuum. That is, a positive score represents a flexibility dominant type and, on the contrary, a negative score represents a control dominant type.

**Trust – antecedent variable.** The measurement of trust was adopted from Huff and Kelley (2003, 2005). The measurement includes eight items which capture the climate of trust inside a company as well as firm’s trust for external parties such as customers, suppliers, and alliances (Huff and Kelley, 2003, 2005). With these measures of organizational trust, the respondents were asked to rate the extent of trust all through the company, instead of their own trust.

**Control variables.** In this research, firm size and industry are considered as control variables since they are potentially able to influence OP. Firm size reflects past success and may influence current performance (Aldrich and Auster, 1986). Large firms may suffer from increasing inertia and become less efficient and effective (Ranger-Moore, 1997). On the other hand, larger companies are often more powerful and have more...
resources than their small counterparts. It is also argued that larger business could derive greater benefits from IC leverage (Bontis et al., 2000). Industry type is another important control variable affecting OP. Companies from different industries may vary in possessing IC as well as PMS and then in realizing benefits from leveraging such value creation factors. Therefore, the potential effect of industry is needed to be controlled for.

5. Results

Frequency distributions were obtained for all the personal data or classification variables. As presented in detail in Table III, respondents’ profiles are based on the organizations’ characteristics which consist of the type of industry, number of employees, and annual sales turnover. Also, Table IV covers demographic profile based on the individual that includes gender, age, education level, and employment with the company (years of working experience).

Most respondents are from the manufacturing industry, which is the biggest industry player in Iranian public listed companies, with the dominant proportion of 80.5 percent. Regarding the number of employees, almost 21.1 percent of the organizations

<table>
<thead>
<tr>
<th>Profile Categories</th>
<th>Frequency</th>
<th>%</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of the industry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>103</td>
<td>80.5</td>
<td>80.5</td>
</tr>
<tr>
<td>Non-manufacturing</td>
<td>25</td>
<td>19.5</td>
<td>100.0</td>
</tr>
<tr>
<td>No. of employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 100</td>
<td>27</td>
<td>21.1</td>
<td>21.1</td>
</tr>
<tr>
<td>100-200</td>
<td>26</td>
<td>20.3</td>
<td>41.4</td>
</tr>
<tr>
<td>201-400</td>
<td>17</td>
<td>13.3</td>
<td>54.7</td>
</tr>
<tr>
<td>401-600</td>
<td>27</td>
<td>21.1</td>
<td>75.8</td>
</tr>
<tr>
<td>More than 600</td>
<td>31</td>
<td>24.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Sales/turnover (based on billion riyals)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 500</td>
<td>60</td>
<td>46.9</td>
<td>47.6</td>
</tr>
<tr>
<td>501-1,000</td>
<td>19</td>
<td>14.8</td>
<td>62.7</td>
</tr>
<tr>
<td>1,001-1,500</td>
<td>6</td>
<td>4.7</td>
<td>67.5</td>
</tr>
<tr>
<td>1,501-2,000</td>
<td>6</td>
<td>4.7</td>
<td>72.2</td>
</tr>
<tr>
<td>More than 2,000</td>
<td>35</td>
<td>27.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Table III. Demographics profiles (organization)**

<table>
<thead>
<tr>
<th>Profile Categories</th>
<th>Frequency</th>
<th>%</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>106</td>
<td>82.8</td>
<td>83.5</td>
</tr>
<tr>
<td>Female</td>
<td>21</td>
<td>16.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 30 years old</td>
<td>19</td>
<td>14.8</td>
<td>15.1</td>
</tr>
<tr>
<td>31-40 years old</td>
<td>33</td>
<td>25.8</td>
<td>41.3</td>
</tr>
<tr>
<td>41-50 years old</td>
<td>46</td>
<td>35.9</td>
<td>77.8</td>
</tr>
<tr>
<td>Over 50 years old</td>
<td>28</td>
<td>21.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor</td>
<td>74</td>
<td>57.8</td>
<td>59.2</td>
</tr>
<tr>
<td>Masters</td>
<td>39</td>
<td>30.5</td>
<td>90.4</td>
</tr>
<tr>
<td>PhD</td>
<td>12</td>
<td>9.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Employment with this company (years of working experience)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1 year</td>
<td>2</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>1-2</td>
<td>17</td>
<td>13.3</td>
<td>15.1</td>
</tr>
<tr>
<td>3-5</td>
<td>29</td>
<td>22.7</td>
<td>38.1</td>
</tr>
<tr>
<td>6-10</td>
<td>43</td>
<td>33.6</td>
<td>72.2</td>
</tr>
<tr>
<td>Over 10</td>
<td>35</td>
<td>27.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Table IV. Demographics profiles (individual)**
employed less than 100 employees, while the rest (78.9 percent) possesses more than 100 employees. In this regard, the employee group of “more than 600” was most in terms of proportion with 24.2 percent of the total respondents while the employee group of “201-400” was the least with 13.3 percent. Moreover, 61.7 percent of the companies have less than 1,000 billion riyals annual turnover while the rest (38.3 percent) gain more than 1,000 billion riyals. In this respect, the annual turnover group of “less than 500” was most in terms of proportion with 46.9 percent of the total respondents whereas the sale group of “1,001-1,500” and also “1,501-2,000” were the least with 4.7 percent.

Partial least square (PLS) was employed to assess both the measurement and structural models. PLS has been widely adopted by IC scholars (Bontis, 1998; Bontis et al., 2000; Cabrita and Bontis, 2008; Cleary et al., 2007) due largely to its capability to model linear associations regardless of the limitations of other SEM techniques, such as normality and large sample size that coordinates with estimated indicators (Chin et al., 2003). Similar to other structural equation modeling techniques, a two-step process is typically utilized in PLS (Chin et al., 2003; Chwelos et al., 2001; Karimi et al., 2004; Ko et al., 2005; Teo et al., 2003; Wixom and Watson, 2001). The measurement model is assessed at the outset, along the same lines as factor analysis and tests of unidimensionality. The second phase is assessing the structural model with the aim of providing path coefficients which demonstrate the associations of each variable. The estimation of the measurement model provides factor loadings and reliability measures from items to latent constructs whereas the assessment of the structural model illustrates the path coefficients for significant effects on the relationships between constructs.

5.1 Measurement model

Unidimensionality is presented by composite reliabilities of the constructs that are shown in Table V. The reliability level is desirable at 0.8 for the basic study while it is acceptable at 0.7 for the exploratory study (Hair et al., 1998). An internal consistency measure (Cronbach’s $\alpha$) developed by Fornell and Larcker (1981), and composite reliability calculated by Bacon et al. (1995), are typically reported. Among seven constructs, four constructs have a Cronbach’s $\alpha$ in the 0.90s; two constructs (human capital and social capital) are in the 0.80s. The composite reliabilities are shown in Table III range from 0.88 (social capital) to 1 (organizational culture) which are acceptable by the guideline suggested by Hair et al. (1998).

Construct validity can be assessed through the estimation of each measure’s convergent, discriminant validity or factor loadings of each item in each construct. Construct, convergent, and discriminant validity were demonstrated in several articles (e.g. Ko et al., 2005; Karimi et al., 2004; Teo et al., 2003; Chin et al., 2003; Chwelos et al., 2001). A publicly acknowledged rule of thumb is to accept items with loadings of 0.70 and

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Average variance extracted (AVE)</th>
<th>Composite reliability</th>
<th>Cronbach’s $\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational culture</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Trust</td>
<td>0.7882</td>
<td>0.937</td>
<td>0.9103</td>
</tr>
<tr>
<td>Human capital (HIC)</td>
<td>0.6076</td>
<td>0.9027</td>
<td>0.8706</td>
</tr>
<tr>
<td>Structural capital (SIC)</td>
<td>0.597</td>
<td>0.922</td>
<td>0.9032</td>
</tr>
<tr>
<td>Relational capital (RIC)</td>
<td>0.6299</td>
<td>0.9315</td>
<td>0.9164</td>
</tr>
<tr>
<td>Social capital (SOIC)</td>
<td>0.6498</td>
<td>0.8812</td>
<td>0.8235</td>
</tr>
<tr>
<td>Organizational performance (OP)</td>
<td>0.7882</td>
<td>0.9712</td>
<td>0.9666</td>
</tr>
</tbody>
</table>

Table V. Results of confirmatory factor analysis.
higher, that implies that there is more shared variance between the construct and its measures than error variance (Barclay et al., 1995; Hair et al., 1998). According to Bollen (1989), the larger the factor loadings, the stronger the evidence of unidimensionality is. In this study, the factor loadings were all above 0.70 except for items SIC1, RIC1, RIC10, and OP10 which were in the 0.60s. These items were dropped in four iterations, in each iteration just one item was dropped, since their factor loadings were lower than 0.70. Eventually, the results became satisfactory following the carrying out of the second calculation of the overall measurement model and after deleting aforementioned items.

Convergent validity is defined as the extent to which constructs which must be associated theoretically are actually interrelated (Campbell and Fiske, 1959) whereas discriminant validity is defined as the extent to which constructs which must not be associated theoretically are not interrelated in effect (Campbell and Fiske, 1959). Convergent validity is obtained when the average variance extracted (AVE) between the constructs exceeds 0.5. AVE provides a measure of the variance shared between a construct and its indicators. In Table IV, the lowest AVEs (0.597 and 0.6076) contribute to structural capital (SIC) and human capital (HIC), respectively, and other constructs have their ranges between 0.6299 (relational capital/RIC) and 1 (organizational culture).

This research drew upon the suggestion of Fornell and Larcker (1981) in order to assess discriminant validity: the square root of AVE must be larger than the correlations of the constructs to achieve acceptable discriminant validity. Hence, the value of diagonal elements must be higher than those of off-diagonal elements (Fornell and Larcker, 1981; Hulland, 1999). As a result, the values presented in Table VI shows acceptable discriminant validity. Overall, all the statistics reveal that the measurement model is adequate and sufficient for testing the structural model.

Common method bias typically occurs given that we collected the data from the same informants as well as the constructs use subjective measures. Accordingly, suitable technique, i.e. single-factor test was carried out for evaluating whether common method bias is a serious issue or not. According to Podsakoff et al. (2003), Harman’s one-factor or so-called single-factor test (Harman, 1976) is one of the most frequently used methods which enable researcher to deal with the problem of common method bias. Overall, the results indicate that CMB is not a significant issue in the study.

5.2 Structural model
In PLS path modeling, the structural model is assessed through estimating the path coefficients along with the $R^2$ value. While path coefficients show the strength of the

<table>
<thead>
<tr>
<th>Variables</th>
<th>CULTURE</th>
<th>HIC</th>
<th>OP</th>
<th>RIC</th>
<th>SIC</th>
<th>SOIC</th>
<th>TRUST</th>
</tr>
</thead>
<tbody>
<tr>
<td>CULTURE</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIC</td>
<td>0.3764</td>
<td>0.779487</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OP</td>
<td>0.2808</td>
<td>0.6443</td>
<td>0.888763</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIC</td>
<td>0.2163</td>
<td>0.6127</td>
<td>0.618</td>
<td>0.793662</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIC</td>
<td>0.3999</td>
<td>0.7712</td>
<td>0.6186</td>
<td>0.6167</td>
<td>0.772658</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOIC</td>
<td>0.3544</td>
<td>0.7413</td>
<td>0.5281</td>
<td>0.6097</td>
<td>0.6832</td>
<td>0.806102</td>
<td></td>
</tr>
<tr>
<td>TRUST</td>
<td>0.4437</td>
<td>0.634</td>
<td>0.5217</td>
<td>0.5286</td>
<td>0.551</td>
<td>0.6266</td>
<td>0.887806</td>
</tr>
</tbody>
</table>

Table VI. Notes: HIC, Human capital; SIC, structural capital; RIC, relational capital; SOIC, social capital; OP, organizational performance

Discriminant validity
associations among the predictor and criterion constructs, the $R^2$ value is a scale of the predictive intensity of a model for the criterion (dependent) constructs (Ko et al., 2005; Chin et al., 2003). The significance of path coefficients in the model lends support for hypothesized associations (Bentler, 1989). SMARTPLS V2.0 M3 (Ringle et al., 2005), was chosen to use a bootstrap resampling method (5,000 resamples) to determine the significance of the paths within the structural model. Figure 3 and Table VII demonstrate results of the SEM assessment which consists of standardized path coefficients $\beta$ in addition to their corresponding $t$-statistics extracted from PLS estimation. The bootstrap resampling technique with 5,000 resamples was conducted for estimating the standard errors.

The standardized coefficients of the effect of organizational culture on human capital and structural capital provide support for $H1a$ and $H1b$, respectively. That is, culture (flexibility dominant cultural type) has a positive impact on human capital with

\[
R^2 = 0.421
\]

\[
R^2 = 0.342
\]

\[
R^2 = 0.281
\]

\[
R^2 = 0.402
\]

\[
R^2 = 0.545
\]

Notes: The bold lines indicate significant paths, and the others indicate insignificant paths. The path coefficients $\beta$ are shown above with their corresponding $t$ critical value below. $^*p<0.1$ level ($n=128$, $t$-critical value=1.65); $^{**}p<0.05$ level ($n=128$, $t$-critical value=1.96); $^{***}p<0.01$ level ($n=128$, $t$-critical value=2.58)
a path coefficient of 0.119, t-value 2.033 and significant at \( p < 0.05 \) (H1a). Culture has 42 percent variance explained by human capital. Similarly, there is a significant relationship between culture and the structural capital with a path coefficient of 0.191, t-value 2.448 and significant at \( p < 0.05 \) (H1b). Culture has 34 percent variance explained by structural capital. Conversely, the results do not support H1c and H1d since no statistical significance was found between culture and relational capital (\( \beta = -0.0288 \)) and social capital (\( \beta = 0.0857 \)).

Furthermore, the data analysis reveals that there is a significant positive association between the level of trust and the four components of IC (i.e. human capital, structural capital, relational capital, and social capital), supporting H2a (\( \beta = 0.583, t = 9.984, p < 0.01 \)), H2b (\( \beta = 0.4776, t = 7.002, p < 0.01 \)), H2c (\( \beta = 0.548, t = 7.032, p < 0.01 \)), H2d (\( \beta = 0.5906, t = 8.285, p < 0.01 \)), respectively.

The results of the research confirm that human capital positively affects OP, which supports the H3a: the higher the level of human capital, the higher is the OP level. The results indicate there is statistical significance to this positive relationship, with a path coefficient of 0.323 and t-score of 3.039 at a 0.01 level of significance. Also, the data analysis reveals that there is a significant positive association between the structural capital and OP, supporting H3b (\( \beta = 0.211, t = 1.782, p < 0.1 \)). The results also reveal that there is a positive association between relational capital and OP, which supports H3c: the higher the level of relational capital, the higher is the OP level. The results show there is a statistically significant positive relationship between the path coefficient of 0.325 and t-score of 3.802 at a 0.05 level. Conversely, there is no significant relationship between social capital and OP (\( \beta = -0.0531 \)) which does not support H3d: the higher the level of social capital, the higher is the OP level.

### 6. Discussion and conclusion

In the context of Iran, the findings suggest that organizational culture does play a crucial role toward corporate success and is capable of increasing ICs, in particular human and structural capital, within the Iranian organizations. As ICs are the keys to achieving sustainable competitive advantage that drive economic growth, the development
of ICs has enhanced the economic reform program in Iran. Despite the economic sanctions by the European Union and the USA, Iran economy has grown quite steadily over the years as shown by the average economic growth over the succeeding eight years (2000-2007) was 5.2 percent, and annual economic growth never declined below 4.7 percent in this period (Habibi, 2008). This could be attributed to the strong organizational culture as shown by the strong support and commitment of top management as well as effective and strong leadership of Iranian business organizations. All these have reinforced the development of both human and structural capital that resulted in improved OP.

The findings significantly underline the fact that culture plays a leading part in relation to IC development in terms of human capital within Iranian companies. This implies that although acquiring clever human resources and investing in manpower learning contributes to the company, reaping the full advantage of human capital hinges upon translating the wisdom of organizational members into reusable and sustained actions. This in turn needs a culture through which employee commitment is established, learning and knowledge sharing is promoted, and employees are involved in decision making (Weston et al., 2007).

Moreover, the results of the study reveal that organizational culture has a pivotal role in the development of structural capital. A company with robust structural capital requires a culture in which the organizational members would be able to seek novelties, fail, learn or attempt to discover things once more. (Bontis, 1998; Sánchez-Cañizares et al., 2007). In this manner, culture could be perceived as a business philosophy which enables employees to develop ideas and foster innovation which reinforce structural capital (Sánchez-Cañizares et al., 2007). As Kannan and Aulbur (2004) argued, sustained knowledge management and IC development needs the creation of a corporate memory which is flexible and adaptive for altering requirements. This is best accomplished by a robust organizational culture which lays stress on strong structural capital through requiring innovation, knowledge sharing, and encourages learning via the use of various communication channels (Kannan and Aulbur, 2004). The findings also lend empirical support to the theoretical observations and corroborate the idea of scholars in the field (David et al., 2000; Janz and Prasarnphanich, 2003; Leidner et al., 2010; McDermott and O’Dell, 2001; Nazari et al., 2009; Young et al., 2003).

Contrary to expectations, the results did not support H1c and H1d since no statistical significance was found between organizational culture and relational capital ($\beta = -0.028$) and social capital ($\beta = 0.085$). These two insignificant findings differ from the previous studies (Weston et al., 2007; Nazari et al., 2009; Alavi et al., 2005; Janz and Prasarnphanich, 2003). Such inconsistent results may be generally attributed to the different culture measurement scale, i.e. competing-values approach (Krakower and Niwa, 1985; Henri, 2006). More importantly, this inconsistency probably results from an obvious cultural differences in terms of the attributes of social capital and relational capital between Iranian context and those abovementioned researches which were undertaken within a western setting (Abdallah, 2001). Perhaps, worsening inflation in Iran could somehow contribute to the insignificant relationship between organizational culture and both relational and social capital. As inflation has taken a toll on the quality of life for most segments of Iranian society, relationships between organizations and external parties such customers and suppliers could be adversely affected. Similar implications could also be seen among employees where interaction among them may weaken due to social problems.

The results also strongly highlight the pivotal role of trust in supporting the development of the underlying components of IC within Iranian organizations.
This makes sense due to the fact that if the organization loses the trust of its personnel, they would consequently become less loyal, less motivated, and less productive (Pirson and Malhotra, 2008). In addition, the company will be superseded by other competitors if customers observe a breach of trust. Besides, when there is a lack of trust regarding supplier relationships, more resources and efforts are required for contracting enforcement and monitoring which in turn bring about higher transaction costs. Companies who lose the trust of their investors are likely the quickest of all to perish (Pirson and Malhotra, 2008). The findings suggest that despite the uncertainty inherent within Iran’s economy, loyalty, trust, and perseverance among organizational members are rather high which contribute to the strengths and survival of the Iranian companies. All these findings are consistent with the results of previous studies (David and Fahey, 2000; Ferguson-Amores et al., 2005; Gainey and Klaas, 2003; Horwitz et al., 2003; Isaac et al., 2009, 2010; Lin, 2007; McEvily et al., 2003; Pirson and Malhotra, 2008; Pöyhönen and Smedlund, 2004; Stähle and Hong, 2002).

On the whole, the findings are consistent with the existing literature regarding the role of foregoing three IC components plays in augmenting OP (Bontis, 1998, 2004; Bontis et al., 2000; Chen et al., 2005; Clarke et al., 2011; do Rosário Cabrita and Vaz, 2005; Edvinsson and Malone, 1997; Wang and Chang, 2005). The results confirm that the investment in human, structural, and relational capital can potentially bring about OP improvement in Iranian companies. This implies that human capital is a particularly important element of IC within Iranian public listed companies. Besides, internal organizational systems or so-called structural capital deployed to acquire, accumulate and diffuse organizational information and knowledge seem to influence firm performance directly within Iranian organizations. Also, in response to the external economic pressures, Iranian organizations have every possible step to neutralize the impacts on Iran’s economy by making every endeavor to build, maintain, and constantly develop relationships with external stakeholders. For example, Iranian companies are encouraged to shift its business dealings toward Russia, Asia, and the Gulf Cooperation Council (GCC) Countries where Iran’s volume of trade with Asia and the GCC has steadily increased in the past decade (Habibi, 2008). This initiative has led to improvement in relational capital and company performance.

Conversely, the results of the analysis did not provide support for the significant relationship between social capital and OP (H3d). This implies that social capital which carrying the elements of intra-firm social networks such as associability and shared vision (Tsai and Ghoshal, 1998) do not appear to impact firm performance within Iranian public listed organizations. It seems that social capital in Iranian is not that desirable due to the fact that in many of these organizations, technology-related issues (structural capital) are given more attention compared to social capital-related concerns (Abili, 2011). Accordingly, the fundamental tenet of the social capital theory which assumes that network of relationships embedded within networks of mutual acquaintance and recognition create a precious resource for the conduct of social affairs (Nahapiet and Ghoshal, 1998) is not supported in the context of this study. There has been lesser extent of inconsistency in findings from prior studies regarding the influence of human capital relational capital, and structural capital on OP in comparison with observations on social capital (Bontis et al., 2000; Chen et al., 2005; Firer and Williams, 2003; Wyatt, 2005, 2008). This result presents an unexpected finding, which could be attributed to the different characteristic of organizations’ social capital in Iranian context compared with those western studies (Ellinger et al., 2013; Leana and Van Buren, 1999; Prusak and Cohen, 2001; Stam et al., 2014; Steinfield et al., 2010; Tsai and Ghoshal, 1998; Youndt and Snell, 2004).
The other plausible explanation is that social capital *per se* and without the other main components of IC may not be effective enough to make a major breakthrough within companies (Yusoff, 2003). In this respect, some recent IC scholars (e.g. Herremans *et al.*, 2010; Nazari *et al.*, 2009; Huang *et al.*, 2010) do not even separate the components of IC and use an aggregate IC concept owing to the strong intercorrelation among the IC components. Future research might seek to clarify the basis of the inconsistent result through considering the aggregated score of IC to affect performance.

### 6.1 Implications

#### 6.1.1 Theoretical implications

The findings of this study have several implications. First and foremost, this study combines literature on IC across diverse academic fields. The complex conceptualization of IC with four sub-dimensions as well as supplementing two antecedent constructs (trust and organizational culture) offer a more systematic manner to combine several knowledge-based drivers toward performance which have not been addressed simultaneously in a comprehensive framework. According to the model, it seems that majority of the earlier studies have mainly emphasized merely some particular dimensions of IC like structural capital and human capital. In contrast, components such as relational capital and social capital have overlooked in the literature (Jansen *et al.*, 2006). Responding to this issue, this study offers a more comprehensive set of empirical evidence to shed light on the role of IC in increasing desirable organizational outcomes through synthesizing the multiple aspects of IC in one research model.

Second, as mentioned above, this study contributes also by empirically investigate trust and organizational culture as the two important determinants of IC as proposed by Bontis (1999). In other words, regarding theoretical perspective, this study extends prior IC literature employing a contingency view by exploring the effect of organizational culture and trust on the IC development. Therefore, the other main contribution of this research lies in its being among the very early research on exploring the linkage between context (contingency factors) and IC development. In line with the organizational effectiveness literature as well as contingency theory, the findings of the study highlight the importance of organizational culture and trust in motivating and maximizing the value of its intellectual assets (Yu and Yanfei, 2008).

#### 6.1.2 Practical implications

Addressing two antecedent variables (i.e. culture and trust) as well as the four key IC components, namely human, structural, social, and relational capital in one research model contributes to practice from different aspects. First, the provision of various sub-elements of IC support executives detect, capture, and assess the different kinds of knowledge resources which must be taken into consideration one by one for maximizing OP. Second, the relative significance of IC dimensions to be driven from this research pave the way for managerial strategies and showing the right direction toward effective and appropriate resource allocation. Managers may prefer to invest in a specific dimension of IC since entities are encountering scarce resources nowadays. Accordingly, managers make every endeavor to choose and invest in the most appropriate component of IC to obtain performance more effectively (Roos and Whitemill, 1998). In addition, recognizing the diverse type of intangible resources as the critical drivers of OP makes it possible for a firm to reap maximum benefit of the intangible assets. For instance, when some IC factors are substituted for one another, it is not required to employ them at the same time for achieving desirable outcomes eventually. If this is not the case, it may lead to decreased performance at the margin (Rothaermel and Hess, 2007). Conversely, an intangible resource could be integrated with
its supporting resources if some IC factors are complements, thereby receiving an extra boost in performance (Rothaermel and Hess, 2007). To sum up, a multidimensional and comprehensive conceptualization of IC would assist executives to remedy the inefficiency in the exploitation of IC (Edvinsson and Sullivan, 1996), and provide a robust system in order to measure and capture IC and the generated performance (Molnar, 2004).

6.2 Limitations and suggestion for future research

In spite of its contributions, this research is also subject to some potential limitations. First and foremost, the instrument of the study was the questionnaire survey which relies largely on the perception and opinions of key informants. Although several authors asserted that perceptual assessments of OP are closely related to more objective ones, they are still subject to the inherent biases, preferences, and perceptual distortions of assessors (Yang and Lin, 2009). In a similar vein, the subjective perceptual measurements were also used to capture IC, trust, and organizational culture constructs given the fact that it was not viable to get relevant objective measures capturing these constructs, particularly the multidimensional concept of IC. Objective measures tend to be less prone to respondent bias although it is argued that both perceptual and objective measures of knowledge-based resources are broadly equivalent (Sharabati et al., 2010). As mentioned earlier, perceptual data has been used widely in IC literature to measure knowledge-based assets since ad hoc questions are more appropriate for collecting aspects closer to a specific and internal phenomenon, unlike proxies obtained from databases (Delgado, 2011).

While the research’s instrument was tested either in terms of the reliability or the validity, there remain some types of bias when the key informants assess their own performance. The bias would be alleviated if external parties such as customers, suppliers, allied partners, and competitors, who are classified under the organization’s relational networks, will assess the firm’s performance. Besides, it would be beneficial if there was a possibility to analyze the annual reports to verify the information provided by the respondents.

Second, the data presented in this research is regarded cross-sectional or one-shot. Those critical factors were captured and measured just once and at a static point instead of as they were developing, thereby missing the value of time explanation. It is imperative to attach importance to long-term effects, particularly on the creation and development of the IC and organizational culture. Besides, survey data derived from cross-sectional analyses is incapable of producing conclusive evidence of causality. Instead, the evidence should be regarded in line with theoretical arguments and expected associations. Future research could embark longitudinal survey in order to investigate the causality and interrelationships among factors which are pivotal to IC development.

Third, the data were collected in a single country (Iran). Potential culture limitations should be noted, especially the cultural differences among developing countries and developed nations that influence the perceptions of knowledge sharing practices. The framework of the study must be examined further through including samples from other countries to generalize or modify the concepts. Moreover, concerning the concept of organizational culture, despite an acceptable reliability and validity of the instruments, richness could not be completely acquired via a survey instrument as organizational culture is perceived as a broad construct.

Fourth, having single-informant per firm is another limitation. Future research may also focus more explicitly on micro-foundations of routines, for example, by obtaining self-reports of the level of knowledge resources from the managers of other departments.
and divisions such as human resource, R&D, and etc. While gaining multiple respondent
data per organization is challenging, it would allow for a more rigorous testing of micro-
foundations to IC and its contributions toward positive organizational outcomes.

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