Received 17 January 2019
Revised 21 March 2019
9 August 2019
19 September 2019
Accepted 31 October 2019

Intellectual capital based reputation for market internationalization

The case of engineering consultancy firms

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Abstract

Purpose – The purpose of this paper is to report the possible impact of intellectual capital (IC) on firm reputation (FR) and investigates if there is a relationship between FR and market internationalization (MI).
Design/methodology/approach – The data were collected from engineering consultancy firms (ECFs) in Turkey. The study employed structural equation modeling to examine the hypothesized relationships between IC, FR, and MI of ECFs.
Findings – ECFs with strong human and structural capital can have a good FR. However, healthy relational capital may not lead to the same effect on FR. On the contrary, FR can create high-quality relational capital for ECFs. Lastly, a good FR, based on robust human and structural capital, can provide the success of ECFs' MI process.
Research limitations/implications – This model may be analyzed for other knowledge-intensive business services. Also, subsequent researches may investigate potential variations in results about other sectors and geographical areas. Moreover, various constructs may be included in the model. However, a greater number of samples could lead to distinctive outcomes.
Practical implications – The research may be a general guide for related professionals and their companies to build long-term strategies, given IC, FR and MI. In this respect, they should take into account human and structural capital for MI.
Social implications – ECFs that can be active in the international arena may maintain their services by financial sustainability. Thus, the advantage may result in a prosperous society.
Originality/value – The study is first to suggest a model joining IC and FR for the MI process of ECFs. This is suitable for competition of ECFs that are willing to be sustainable firms.

Keywords Intellectual capital, Reputation, Engineering consultants, Market internationalization

Paper type Research paper

1. Introduction

The sum of all knowledge assets and knowing capabilities are described as intellectual capital (IC) (Wang *et al.*, 2014). IC deals with the valuation of knowledge and aims to gain sustainable organizational competitiveness especially in international markets (Youndt *et al.*, 2004). IC also plays a key role to comprehend the drivers behind firm reputation (FR), as it provides name recognition gained through strategic positioning (Harrison and Sullivan, 2000). Similarly, Petkova *et al.* (2008) posit that the proper management of IC represents a significant improvement in the company's value and reputation. Moreover, Petty and Guthrie (2000) assert that FR may be accepted as a by-product of the judicious use of IC, rather than a component. Based on this linkage advocated by aforementioned studies, there are some other mainstream researches that claim the probable effect of IC on FR. Rindova *et al.* (2005), one of

The authors gratefully acknowledge chairpersons, managers and other technical/administrative staff of the surveyed firms for their generous collaboration and contributions. The authors also thank the financial support provided by the Committee on Research Grants of Zonguldak Bulent Ecevit University.

Journal of Intellectual Capital
Vol. 21 No. 1, 2020
pp. 40-61

1469-1930
DOI 10.1108/JIC-01-2019-0010

these researches, empirically found that the relational capital of the US business schools contributes significantly to a favorable FR. Zabala *et al.* (2005) theoretically advocate that relational capital determines FR. In another theoretical study, Cravens and Oliver (2006) suggest that human capital can play a considerable role in the overall positioning of FR. Highhouse *et al.* (2009) theoretically propose that both relational and human capital are required for FR. Lastly, Ginesti *et al.* (2018) empirically support that human capital of Italian companies is the key to FR. Looking at all these previous studies in the literature, there are only a few empirical researches and little is known concerning the impact of the elements of IC on FR. In addition, to the best of our knowledge, the relationship between FR and the three elements of IC has not been investigated together in an empirical way up to date.

FR has also a considerable impact on market internationalization (MI) of knowledge-intensive services provided, for example, by engineering consultancy firms (ECFs). This is because such organizations with good reputations have the ability to influence and be selective of the countries they decide to enter (Javalgi and Grossman, 2014). With this characteristic, FR facilitates investments for knowledge-intensive international companies with proper IC especially in developing countries where domestic corporations may suffer from the lack of IC-based reputation (Musteen *et al.*, 2013; Seleim and Bontis, 2013). Besides these researches that make the theoretical reasoning for linking FR and MI, there are only a few other fundamental studies concerning the likely impact of FR on MI. As one of these studies, Zyglidopoulos *et al.* (2006) theoretically argue that FR can assist small- and medium-sized cluster firms in the MI process. Mariz-Perez and Garcia-Alvarez (2009) found that higher FR favors the MI process. Considering all these past studies, it is seen that only Mariz-Perez and Garcia-Alvarez (2009) empirically examined the relationship between FR and MI. However, they focused on Spanish franchised chains and, as the chains favor the adoption of an MI strategy, their results cannot be easily adapted and accepted by other types of firms. Kuivalainen *et al.* (2012) claim that MI patterns of knowledge-intensive firms are often different from those of companies operating in the manufacturing industry. This is because knowledge-intensive firms are essentially based on their technical knowledge instead of plants and machines/equipment that should typically be employed in the manufacturing industry. This means that they do not possess any critical physical asset to move or purchase/hire. Through this characteristic, the time lag between the founding of a knowledge-intensive firm and the commencement, growth, and development of its international operations abroad becomes much shorter (Zucchella *et al.*, 2007). Based on the same argument, these firms can begin to operate in multiple countries on international markets almost from inception, whereas the manufacturing companies have naturally a narrow market scope at the beginning of their international operations (Yeoh, 2004). Therefore, to the best of our knowledge, the possible presence of the relationship between MI and FR has not been empirically investigated in the related literature for companies except for the franchised chains.

ECFs can serve private and public clients for a number of activities such as feasibility reports, project management, design, bidding, contracting, construction management and controlling (Gaskell, 2015). This broad range of services is usually more significant in international projects when compared to domestic ones (ATCEA, 2015). This is because, in many instances, an ECF can provide: export opportunities for material vendors and equipment suppliers; and business opportunities for contractors from its respective home country (TCA, 2016). However, ECFs may suffer from their relatively low level of international works. For example, there were solely six firms from Turkey among the largest 225 international ECFs in 2017 (ENR, 2018a). From the financial point of view, the average annual turnover of Turkish ECFs has been $400m up to date when national and international revenues are taken into account together (ATCEA, 2018). Despite this view in the domain of technical consultancy, Turkish contractors have been very active in the

world. Looking at the top 250 international contractors, there were 46 firms from Turkey in the list in 2017. With this performance, Turkey was ranked second in the list after China (ENR, 2018b). With monetary terms, the international turnover of Turkish contractors was $15bn in 2017 (TCA, 2018). However, the contracting business simply brings an average net profit margin between 2 and 5 percent, despite its hard physical working conditions (Burtonshaw-Gunn, 2009). On the contrary, the consultancy business has much more profitability and a value-added characteristic because of its knowledge-intensive nature (Myers, 2017). With this feature, it seems a more reasonable field than the contracting activities to invest in for firms through their IC and monetary resources and to focus on for governments through their prospective financial incentive schemes.

Given that these arguments have been postulated in the literature so far, the present research concentrates on ECFs in particular and examine a likely model of IC as a possible contributing factor to MI by employing the FR concept. However, there is a lack of empirical proof to reveal the truth of this relationship. In other words, although both the impact of IC on FR and the impact of FR on MI have been studied by few researches quoted in Section 2.4, these relationships have not been examined from the ECFs' point of views. Moreover, there is no academic study that links and combines IC, FR and MI, together. Accordingly, this study undertakes to close this theoretical gap available in the literature by means of real empirical evidence. Besides the aforementioned contribution of the study to research, its practical contribution should also be depicted. This research aims to use IC as the antecedent variable for employing the FR concept and thus for clarifying the MI process of ECFs. This is because, as explained in the former paragraph, engineering consultancy services constitute a huge industry around the world and many ECFs from developed and developing countries compete with each other in violent business conditions. Based on the knowledge-intensive characteristic of these services, industrial practitioners may gain a competitive advantage for their firms by comprehending the role of IC initially and by obtaining FR later as a potential facilitator for a sustainable bid-winning behavior and a healthy MI process. In doing this, FR is used as a mediating variable between IC and MI, since FR can be managed, can give strategic benefits, and can be altered and affected by exogenous factors such as industrial atmosphere (Balmer and Greyser, 2016). In conclusion, the current paper shows the effect of IC on implementing the FR concept and identifies the relationship of FR on the MI process. The selected domain to examine the effects of IC components on MI is the engineering consultancy industry. This is because it plays a key role around the world through its well-known knowledge-intensive feature and its half million establishments with three million staff members and around $500bn revenue (Gross, 2012). This presents a significant business opportunity especially for managers working in the engineering discipline.

Considering the aforementioned important aspects of the engineering consultancy industry and the theoretical gap mentioned above, this research integrates IC and FR for the first time to draw reasonable directions for the MI process of ECFs. This interaction attempts to describe the drivers behind the MI process of ECFs and to explain the significance of IC in the domain of engineering consultancy. However, it should be noted that IC will probably add value to all industries, as it has a substantive relationship with the business performance regardless of industry sector (Bontis *et al.*, 2000). Hence, this research may also be conspicuous and useful for enterprises in other industries such as manufacturing.

2. Literature review for hypotheses development

2.1 Intellectual capital

The importance of IC investments is recognized in most countries, since knowledge assets affect a firm's long-term competitive advantage and value creation (Cabello-Medina *et al.*, 2011). IC produces multiple effects throughout an organization and guarantees real benefits

by means of its knowledge-based resources that tend to be valuable, rare and neither imitable nor substitutable (Kong and Ramia, 2010). With these characteristics, IC contributes to companies' financial and market performance (Nimtrakoon, 2015).

Although there have been several different frameworks applied to IC components, they are similar in nature (De Silva *et al.*, 2014). As the most widely accepted categorization in the related literature, IC is defined through its three main elements: human capital, relational capital, and structural capital (Herremans *et al.*, 2011). This is because the tripartite IC taxonomy appears to be an emerging standard (Inkinen, 2015) and is useful in a large number of countries and business contexts (Cabrilo and Dahms, 2018).

Human capital. This capital comprises the level of creativity, knowledge and idea development skills residing within and utilized by individuals in organizations (Prajogo and Oke, 2016). In the empirical literature, it is usually assumed to affect firm performance positively, and there is sufficient evidence to support this claim (Scafarto *et al.*, 2016). From the perspective of international engineering services, it has clearly utmost importance, since domestic firms from developing countries are generally outperformed by their competitors from developed countries (Cheah and Chew, 2005). In this point, it should be noted that human capital is one of the most valuable strategic resources of born global firms that are usually characterized by their knowledge-intensive products and services (Knight and Liesch, 2016).

Relational capital. This component of IC is the knowledge embedded in a firm's external relations with agents, customers, suppliers, competitors, partners, clients, shareholders, industrial associations, society, government and networks (Sharabati *et al.*, 2010). It is critical to organizations, as it helps to create organizational value by connecting internal intellectual resources with external stakeholders (Kong and Farrell, 2010). Moreover, relational capital likely has a considerable aspect in the development process of born global firms (Loufrani-Fedida *et al.*, 2019). In terms of ECFs, the greater the relational capital, the stronger the influence of relational capital on the competitive capability (Yitmen, 2011).

Structural capital. It is a supportive infrastructure for human resources and knowledge (Benevene *et al.*, 2017). It includes a number of elements such as organizational know-how, information systems, databases, procedures, processes, corporate culture, business development plans, intellectual property, strategy, organizational charts and manuals (Kamukama *et al.*, 2010). Among these elements, especially organizational culture and information technology capability are proposed as significant components in the performance of born global firms (Zhang and Tansuhaj, 2007). In order to make use of structural capital, engineers need to be able to make appropriate interpretations and adaptations of rules to fit the problem situation at hand (Soderlund and Bredin, 2013). Toward this target, for example, Igo and Skitmore (2006) could identify the form of corporate culture of an ECF by employing the competing values framework.

2.2 Firm reputation

Reputation is defined as a collective representation of a firm's past actions and results that describe the firm's ability to deliver valued outcomes to multiple stakeholders (Urde and Greyser, 2016). In today's world, where ideas are increasingly displacing the physical in the production of economic value, competition for reputation becomes the significant driving force, propelling national economies forward (Hannington, 2016). A positive reputation increases the likelihood that stakeholders will contract with a given firm (Rhee and Haunschild, 2006). However, FR may have different dimensions and is issue specific (Walker, 2010).

ECFs are deeply engaged with, and knowledgeable about, what FR is and how it helps them (Sheikh and Lim, 2011). This is because FR is accepted as an important sub-factor

considered for the strategic pricing of professional engineering consultancy services (Adesi *et al.*, 2018). In this context, engineers interpret FR as a sign of quality, integration and means of winning large scale projects (Sheikh and Lim, 2015).

2.3 Market internationalization

MI can be defined as the expansion of firms across country borders into geographic locations that are new to them (Kafouros *et al.*, 2008). There is strong evidence of the importance of MI in positively affecting the firm performance (Almodovar *et al.*, 2014). In the domain of knowledge-intensive business services such as engineering consultancy, the use of these services is a cause of MI (Griffith and Rubera, 2014). The primary reasons for the MI process of ECFs are associated with their motivations related to growth and financial viability (London, 2010). However, it is clear that the attitudes of top management are important in formulating and effectively implementing an MI strategy (Shih and Wickramasekera, 2010). Similarly, individual professionals also play a significant role for the MI process of ECFs (Krull *et al.*, 2012). As a result, for an improved and better performance in international engineering projects, foreign ECFs should offer a focused range of niche/specialty products and services in the host country (Ling and Li, 2016).

2.4 Firm reputation links with intellectual capital

Firm reputation and human capital. Human capital efficiency is a key driver of FR (Ginesti *et al.*, 2018). On the one hand, human capital is an intangible asset that is difficult to imitate and thereby may help companies accumulate reputation (Sardo and Serrasqueiro, 2017). On the other hand, it can play a synergistic role in the overall positioning of FR (Cravens and Oliver, 2006). Investments in human capital affect stakeholders' impressions of organizations, and thus, the general FR assessment (Highhouse *et al.*, 2009). As for ECFs specialized in delivering knowledge services, human capital should initially be promoted for the extensive FR (Huang and Hsueh, 2007). Thus, *H1* is proposed as follows:

H1. Human capital of an ECF is positively related to its FR.

Firm reputation and relational capital. In order to have a continued value, FR must be based on relational capital, since this is not easily imitated and available in the short-term market (Walsh and Wiedmann, 2004). Relational capital produces FR, when parties successfully exchange insights, experience, and information (Bronn, 2007). In other words, in order to satisfy stakeholders' need for information and to balance their conflicting demands, especially firms in knowledge-intensive industries (e.g. engineering consultancy) may engage in voluntary disclosures about their IC (Yau *et al.*, 2009). In practice, IC disclosure is composed of two elements such as periodic reporting and disclosure at the time of event (Giacosa *et al.*, 2017). It helps to prevent the circulation of hearsay and rumor that can prove detrimental to FR (Bornemann and Leitner, 2002). Whiting and Woodcock (2011) empirically found that, when FR derives from IC assets, firms in knowledge-intensive industries show more extensive IC disclosure than those in other industries. A good FR is closely linked to relational capital of an ECF as well (Zabala *et al.*, 2005). In this respect, ECFs are motivated to communicate their knowledge base and to expand their relational capitals as widely as possible in order to build up their FR to increase their chances of being chosen for future projects (Cabrera and Cabrera, 2005). Hence, *H2* is proposed as follows:

H2. Relational capital of an ECF is positively related to its FR.

Firm reputation and structural capital. There is a positive relationship between structural capital and value creation (Marr *et al.*, 2004) for which a good FR has a significant potential and is difficult to replicate (Roberts and Dowling, 2002). As a prominent element of structural

capital, certifications of achievement from institutional intermediaries considerably support FR (Rindova *et al.*, 2005). In the structural capital sphere, it is vitally important that the quality of the engineering output is such that FR is not damaged (Tseng and Goo, 2005). In this context, ECFs maintain that the primary source of their success is directly attributable to their culture as a structural capital (Sexton and Barrett, 2003). Thus, *H3* is proposed as follows:

H3. Structural capital of an ECF is positively related to its FR.

2.5 Market internationalization link with firm reputation

Market internationalization and firm reputation. To describe a firm's internationalization and modus operandi, the dynamism and degree of MI can be used (Nummela *et al.*, 2004). In determining the MI process of firms, FR is a considerable factor (Perrigot *et al.*, 2004). It can assist the MI process by enabling the firm to attract valuable resources that sooner or later local firms can draw on (Zyglidopoulos *et al.*, 2006). Higher FR promotes the international market expansion (Mariz-Perez and Garcia-Alvarez, 2009). In the same way, MI is also influenced by FR of knowledge-intensive service firms such as ECFs (Javalgi and Grossman, 2014). This is because knowledge-intensive products and services both enable positional advantages in global markets and foster the accelerated MI (Weerawardena *et al.*, 2007). Especially born global firms develop cutting-edge knowledge-intensive products and services (Weerawardena, 2003), and thus, become market leaders in a product or service with a good reputation (Chetty and Campbell-Hunt, 2004). If an ECF has an excellent FR, the level of uncertainty for a foreign client is lower, and thus, the probability for this ECF to have future assignments increases (Moedas *et al.*, 2012). Thus, *H4* is presented as follows:

H4. FR of an ECF is positively related to its market internationalization.

Considering four hypotheses presented above in a detailed manner, a conceptual model was designed as illustrated in Figure 1. When ECFs have three components of IC, these components may indicate the availability of FR. This means that FR will probably help ECFs internationalize in their professional services.

3. Methodology

3.1 Survey

The present study employed causal and descriptive research designs to discover cause-and-effect relationships among IC, FR and MI.

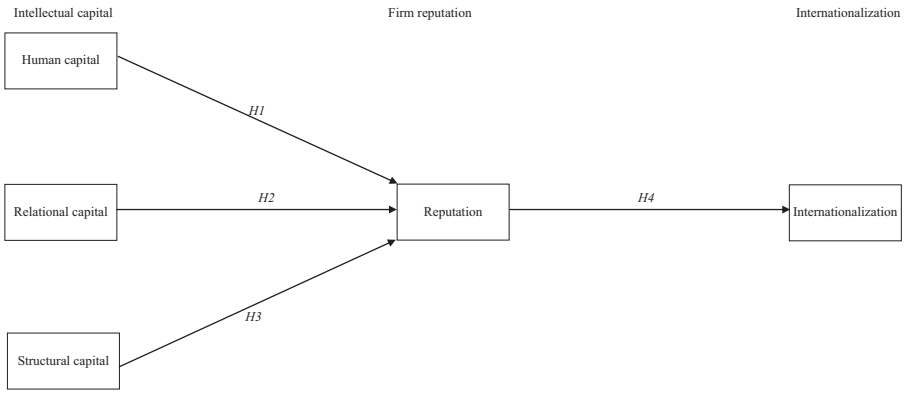

Figure 1.
Conceptual model

A self-administered questionnaire including two parts of 30 questions was designed through a detailed review of the related literature. Part 1 (nine questions) found respondents' demographic features, sizes and experience. Part 2 (21 questions) determined the participants' agreement on twelve items of IC adapted from Chen *et al.* (2014) and Wang *et al.* (2014), six items of FR developed from Helm (2011) and Abdullah and Aziz (2013), and three items of MI adapted from Akerman (2015) and Baum *et al.* (2015). Each statement of IC (about ECFs' advantages for IC) and FR (about high FR) was measured by five-point Likert-type scale from 1 (strongly disagree) to 5 (strongly agree). The greater point denoted that an ECF has more advantages of each IC item and a higher FR than its competitors.

3.2 Sampling and data compilation

The target population of this study was ECFs' owners, project managers, engineers, architects and other technical staff. For this purpose, the Association of Turkish Consulting Engineers and Architects and its 63 members were taken into account. E-mail addresses and telephone numbers of these Turkish ECFs were obtained from their web-pages or via telephone calls by them. The list contained 63 e-mail addresses and telephone numbers of managerial and technical personnel of the companies. For each firm, one participant was contacted for the equal representation of member firms, and thus, for the homogenous view of the industry.

A census questionnaire was applied. An invitation letter was sent to 63 e-mail addresses to participate in the questionnaire through either e-mail or a face-to-face interview. A follow-up e-mail was sent to those who did not respond to the initial survey two weeks later. As a result, 27 (42.86 percent) of the total positively answered the request for filling the survey by e-mail, while 28 (44.44 percent) positively answered the request for a one-to-one interview. In conclusion, 55 replies (87.30 percent) were given. Participants of the remaining eight firms (12.70 percent) said that they were not allowed by their firms to answer the survey. Therefore, other potential participants from these firms were not contacted. For structural equation modeling (SEM), the sample size covers the criteria suggested by Wolf *et al.* (2013) and Sideridis *et al.* (2014).

3.3 Data analysis

A descriptive analysis explored participants' characteristics. Kaiser-Meyer-Olkin (KMO) index and Bartlett's test of sphericity were initially performed to evaluate whether the data compiled are consistent and convenient for the factor analysis. Exploratory factor analysis (EFA) and reliability analysis were subsequently employed to determine and refine five constructs. These were human capital, relational capital, structural capital, FR and MI. It means that EFA with varimax rotation was fulfilled to identify the factor structure and to establish the validity in constructs, since it determines factors through the data compiled and justifies a maximum amount of variance (Fabrigar and Wegener, 2012). Although items and their constructs were developed and adapted from the literature as depicted in Section 3.1, many items were not the same as those taken from the literature. Therefore, EFA was used. In addition, confirmatory factor analysis was employed to evaluate the measurement model validity, because it examines whether the data fit a hypothesized measurement model (Harrington, 2009). It showed composite construct reliability, average variance extracted, convergent validity and discriminant validity of items (Hair *et al.*, 2006).

SEM was used to investigate the conceptual framework suggested in Figure 1 instead of simple regression analysis where a dependent variable is estimated through one or more independent variables. SEM is used for variables as well, however, there is flexibility of multiple dependent and independent variables. This means that SEM finds out simultaneous regression equations that theoretically set the relationship between the observed variables. It thus analyzes more complex models than regression models (Schumacker and Lomax, 2004). In conclusion, it was used to empirically analyze and verify hypotheses, since it can identify

causal relationships between indirect (antecedent) and direct (focal) factors and the resultant factor. Moreover, SEM can construct variables predicted by the measured variables. Therefore, structural relations between variables can be predicted (Lin and Lee, 2005). Lastly, SEM can indicate measurement error (Rigdon, 1994). AMOS v.21 was used to test the conceptual model (Blunch, 2013).

4. Statistical results

4.1 Information on participants

Table I points out demographic characteristics of participants and their companies. In total, 78.18 percent of participants were male, while 21.82 percent were female. It seems to be normal, because the engineering consultancy sector has violent physical conditions. About two-thirds (65.45 percent) of participants had at least an undergraduate degree, as the engineering consultancy business requires such a degree. More than one-third (34.54 percent) were top managers such as owners and project managers. It means that the survey was answered mostly by the managing directors who have highest-level knowledge

Profile	Number of participants	Category	Percentage
Gender	55	Male	78.18
		Female	21.82
Education	55	BSc degree	65.45
		MSc degree	34.55
Position	55	Owner	16.36
		Project manager	18.18
		Site engineer	7.27
		Machine engineer	9.09
		Electrical engineer	5.45
		Architect	7.27
		Technical office staff	36.36
Experience in present position (in year)	55	0–5	32.73
		6–10	32.73
		11–20	16.36
		Above 20	18.18
Experience in the industry (in year)		0–5	20.00
		6–10	27.27
		11–20	23.64
		Above 20	29.09
Employment size	55	1–9	18.18
		10–49	49.09
		50–99	18.18
		100–199	3.64
		200–249	1.82
		Above 249	9.09
Turnover (million $)	55	0.00–0.33	16.36
		0.33–2.67	38.18
		2.67–5.33	30.91
		5.33–8.00	1.82
		8.00–10.67	1.82
		10.67–13.33	1.82
		Above 13.33	9.09
Experience of company (in year)	55	0–5	3.64
		6–10	21.82
		11–20	30.91
		21–50	36.36
		Above 50	7.27

Table I. Profile of respondents and their companies

about their firms' actions and future directions. About one-thirds (34.54 percent) have been employed in their current positions for minimum 11 years. It may point out project-based working conditions in the domain of engineering business. Considering their total experience, 52.73 percent of participants had experience of more than ten years. This shows sufficient experience to thoroughly know present business practices in the industry. In terms of respondents' companies, only 9.09 percent had minimum 250 employees and a turnover of maximum $13.33m. This shows that the vast majority of the surveyed ECFs are small- and medium-sized enterprises. Finally, about third-fourths (74.54 percent) of companies have been in the industry for more than ten years. It means that they have adequate experience to develop convenient strategies related with intellectual resources and international markets. As a result, both participants and their companies seem to have sufficient industrial qualifications for the substantiation of the questionnaire survey.

4.2 Kaiser-Meyer-Olkin and Bartlett's test of sphericity

As given in Table II, the KMO index was 0.759 for IC, 0.707 for FR, and 0.681 for MI. The three numbers are acceptable as recommended by Pett *et al.* (2003), since they are greater than 0.60. In other words, the sampling seems to be adequate for each variable in the proposed model. Also, significance values of 0.00 for the Bartlett's test of three measures are less than 0.05 as proposed by Tabachnick and Fidell (2001). Accordingly, correlation matrix does not form a unit matrix where there exists no relationship among variables. It essentially indicates that the data are approximately multivariate normal and acceptable for the further analysis. Hence, both tests clearly show that a factor analysis may be carried out.

4.3 Exploratory factor analysis

Three items of human capital have high loadings (0.63, 0.73 and 0.69), as they are greater than 0.60 (Table III). Four items of relational capital were loaded high (0.73, 0.70, 0.73 and 0.62), while only one has a reasonably high loading (0.55). In terms of structural capital, four items have two high loadings (0.64 and 0.76), a reasonably high loading (0.57), and an acceptably high loading (0.46). Five items of FR were loaded high (0.66, 0.63, 0.67, 0.82 and 0.76), while only the first was loaded reasonably high (0.53). Finally, three items of MI have high loadings (0.70, 0.96, and 0.96). As a result, subsequent analyses continued without the removal of any item. Thus, 21 items were loaded onto their corresponding conceptual terms. This is because the items have loadings of higher than 0.30 as recommended by Kline (1994). In conclusion, items under each conceptual term can estimate the corresponding term all together.

In Table IV, outcomes of the variance described by 21 items were given. They point out that five constructs (three for IC, one for FR and one for MI) were extracted. Items in each construct explain more than 60 percent of the total variance explained. Therefore, as recommended by King (1969), Kaiser's criterion (eigenvalue $>$ 1) and the total variance explained (the percentage $>$ 5) were covered. In order to interpret the findings, any scree plot was not added. This is because the shape of line in the plot can easily be estimated by looking at the data of the total variance explained, as a scree plot graphs eigenvalue against factor number. More importantly, a scree plot is reliable only when a study has a sample size of at least 200 (Yong and Pierce, 2013).

Table II. Outcomes of KMO and Bartlett's test

Measure	KMO	Bartlett's test χ^2	df	Significance
Intellectual capital	0.759	296.065	66	0.000
Reputation	0.707	130.483	15	0.000
Internationalization	0.681	171.854	3	0.000

Construct	Item No.	Item	Mean	SD	Standardized factor loading
Human capital	1	Our employees hold suitable work experience for accomplishing their jobs successfully	4.29	0.71	0.63
	2	Our employees have excellent professional skills in their particular jobs and functions	4.06	0.80	0.73
	3	Our employees are able to interpret business problems and develop appropriate technical solutions	4.09	0.75	0.69
Relational capital	4	Our company solves problems through intimate communication and effective collaboration with the related party	4.35	0.82	0.73
	5	We have as much feedback out of our customers as we possibly can	4.00	0.84	0.70
	6	Data on customer feedback are disseminated throughout the organization	4.07	0.79	0.55
	7	Our company maintains long-term relationships with customers	4.35	0.67	0.73
	8	Our relations with suppliers are consistent and punctual	4.26	0.76	0.62
Structural capital	9	Systems and operations procedures of our company are very efficient and innovative	4.31	0.54	0.64
	10	Our company responds to changes very quickly	4.13	0.64	0.57
	11	Our company's organizational culture and atmosphere are flexible and comfortable	4.26	0.62	0.76
	12	There is constant support among different departments in our company	4.33	0.61	0.46
Firm reputation	13	Our company always provides high quality services	4.64	0.49	0.53
	14	Our company has responsibility for the community and the environment	4.53	0.54	0.66
	15	Our company has an ability to attract, develop, and retain talented employees	4.22	0.66	0.63
	16	Our company has financial soundness	4.09	0.75	0.67
	17	Our company always behaves in an innovative way	4.27	0.62	0.82
	18	Our company always plans long-term investments	4.20	0.80	0.76
Internationalization	19	The international market offers growth potential	3.91	1.06	0.70
	20	We have increased our international works for the existing customers during the last five years	3.47	1.23	0.96
	21	We have had new customers in the international arena during the last five years	3.49	1.28	0.96

Table III.
Measurement model of constructs

As given in Table V, the rotated factor matrix denotes both factor loadings and rotated components. At least three items were largely loaded on each of five factors. It means that these factors are useful with minimum three items. However, the result of three items of MI could not be rotated because of the extraction of one factor.

Pearson correlation coefficients among pairs of items were presented in Table VI for controlling the availability of relationships. According to the factor matrix, there is a moderate correlation between items due to a very few number of extremely low ($r < 0.30$) or large ($r > 0.90$) coefficients. Moreover, values for determinants were found to be over the rule of thumb of 0.00001, since it indicates the lack of multicollinearity (Yong and Pierce, 2013). Consequently, it would be a vain attempt to eliminate any item.

Item No.	Eigenvalue	% of variance explained	Cumulative % of variance explained
1	4.607	38.393	38.393
2	2.100	17.499	55.892
3	1.323	11.027	66.919
4	0.878	7.318	74.237
5	0.650	5.415	79.652
6	0.600	5.002	84.654
7	0.492	4.099	88.754
8	0.418	3.485	92.239
9	0.290	2.415	94.654
10	0.265	2.209	96.862
11	0.209	1.743	98.605
12	0.167	1.395	100.000
13	3.170	52.831	52.831
14	1.152	19.200	72.031
15	0.618	10.296	82.327
16	0.540	8.992	91.319
17	0.321	5.352	96.670
18	0.200	3.330	100.000
19	2.603	86.763	86.763
20	0.357	11.907	98.670
21	0.040	1.330	100.000

Table IV.
Variances explained by items

Item No.	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
2	0.684				
1	0.736				
3	0.779				
6		0.812			
4		0.746			
5		0.593			
8		0.628			
7		0.699			
9			0.601		
11			0.564		
10			0.687		
12			0.520		
14				0.709	
13				0.665	
15				0.501	
16					0.691
17					0.588
18					0.574

Table V.
Rotated factor matrix

Table VII presents Cronbach's α coefficient scores for five measures. Human capital (0.83), relational capital (0.84), structural capital (0.77), FR (0.81) and MI (0.92) are all reliable. This is because five measures were found to be greater than the cut-off value of 0.60 as suggested by Cortina (1993).

4.4 Confirmatory factor analysis

As illustrated in Figure 2, the model fit was found to be very good. It indicated a highly satisfactory fit of data through degrees of freedom (df) $= 3.00, \chi^2 = 1.492$, and p-value $= 0.684$.

Item No.	1	2	3	4	5	6	7	8	9	10	11
1	1.000	0.589	0.507	0.456	0.512	0.436	0.180	0.387	0.479	0.128	0.267
2	0.589	1.000	0.489	0.312	0.402	0.304	0.131	0.169	0.275	0.339	0.104
3	0.507	0.489	1.000	0.448	0.321	0.387	0.404	0.121	0.259	0.347	0.187
4	0.456	0.312	0.448	1.000	0.505	0.677	0.423	0.509	0.505	0.246	0.198
5	0.512	0.402	0.321	0.505	1.000	0.701	0.546	0.148	0.328	0.432	0.188
6	0.436	0.304	0.387	0.677	0.701	1.000	0.211	0.165	0.327	0.295	0.468
7	0.180	0.131	0.404	0.423	0.546	0.211	1.000	0.244	0.354	0.493	0.205
8	0.387	0.169	0.121	0.509	0.148	0.165	0.244	1.000	0.255	0.396	0.178
9	0.479	0.275	0.259	0.505	0.328	0.327	0.354	0.255	1.000	0.482	0.365
10	0.128	0.339	0.347	0.246	0.432	0.295	0.493	0.396	0.482	1.000	0.536
11	0.267	0.104	0.187	0.198	0.188	0.468	0.205	0.178	0.365	0.536	1.000
12	0.259	0.243	0.434	0.297	0.379	0.584	0.127	0.574	0.222	0.467	0.247
13											
14											
15											
16											
17											
18											
19											
20											
21											

Item No.	12	13	14	15	16	17	18	19	20	21
1	0.259									
2	0.243									
3	0.434									
4	0.297									
5	0.379									
6	0.584									
7	0.127									
8	0.574									
9	0.222									
10	0.467									
11	0.247									
12	1.000									
13		1.000	0.478	0.523	0.338	0.418	0.432			
14		0.478	1.000	0.652	0.421	0.571	0.714			
15		0.523	0.652	1.000	0.788	0.546	0.618			
16		0.338	0.421	0.788	1.000	0.762	0.658			
17		0.418	0.571	0.546	0.762	1.000	0.704			
18		0.432	0.714	0.618	0.658	0.704	1.000			
19								1.000	0.807	0.756
20								0.807	1.000	0.782
21								0.756	0.782	1.000

Notes: Determinant for IC (items 1–12) = 0.067; determinant for FR (items 13–18) = 0.059; determinant for internationalization (items 19–21) = 0.228

Table VI. Factor correlation matrix

Measure	α	Mean	SD	1	2	3	4	5
1. Human capital	0.83	4.15	0.76	–				
2. Relational capital	0.84	4.20	0.78	0.307*	–			
3. Structural capital	0.77	4.25	0.60	0.157	0.477**	–		
4. Reputation	0.81	4.32	0.64	0.118	0.187	0.489**	–	
5. Internationalization	0.92	3.62	1.19	−0.080	0.73	0.185	0.321*	–

Notes: Pearson correlation is significant at *$p < 0.05$; **$p < 0.01$

Table VII. Correlations of constructs

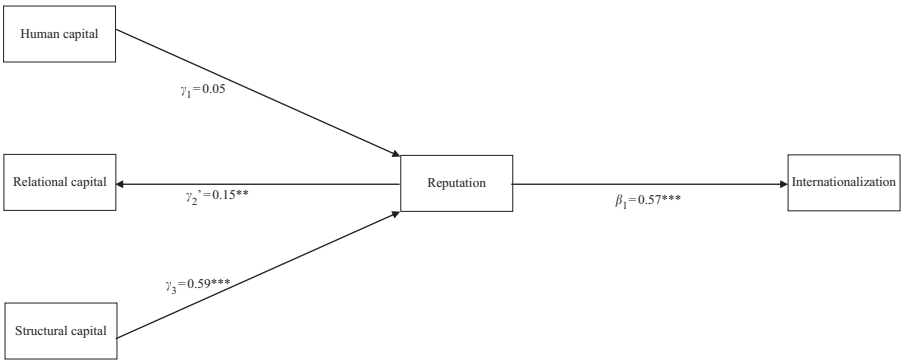

Figure 2.
Estimates and standardized loadings for structural path model

Notes: n=55. Model fit indices: GFI=0.98, AGFI=0.94, CFI=1.00, NFI=0.96, RMSEA=0.000, χ^2=1.492, df=3.00, p-value=0.684. Pearson correlation is significant at **p<0.01; ***p<0.001

Moreover, adjusted goodness-of-fit index was 0.94, comparative fit index was 1.00, goodness-of-fit index was 0.98, normed fit index was 0.96 and root mean square error of approximation was 0.000. As suggested by Schumacker and Lomax (2004), all these statistics covered the criteria needed for the structural fit of samples.

5. Discussion

5.1 Effect of intellectual capital on firm reputation

In order to assess the hypothesized model, SEM with maximum likelihood estimation was carried out. The path diagram that was empirically analyzed is shown in Figure 2. Out of four hypotheses, three (namely *H1*, *H3* and *H4*) offered in Figure 1 were accepted as consistent with the findings of previous similar literature given above in detail. The three paths had supportive standardized loadings (γ and β) and $p \leqslant 0.05$. However, the remaining hypothesis (*H2*) possessed a low index ($p > 0.05$), and thus, the opposite proposition was accepted.

H1 that hypothesizes a positive relationship between human capital and FR was accepted. This finding indicated the positive impact of human capital on FR ($\gamma_1 = 0.05$). In this context, Cheng *et al.* (2006) identified the overall quality of employees working at ECFs as the main client satisfaction criteria. Shi *et al.* (2014) found personnel quality as a key competence of ECFs. Looking at the finding with its literature supports, the employment of dynamic human capital will likely help ECFs gain an FR in the related engineering sector. An ECF with high-quality human capital in terms of education, experience, and managerial/technical capabilities may have an FR, and thereby, be well-known across sectoral stakeholders. Compared to other industrial competitors, this may lead to positive differentiation for its sustainability in the business.

H2 with respect to the relationship between relational capital and FR was rejected. Namely, ECFs that have an advantage of relational capital over potential competitors may not be known for a good FR. A possible explanation for this finding may be the fact that a usual firm instead of a reputable one is likely to act opportunistically (Houston and Johnson, 2000). Given also that trust is regarded as a requirement for FR (Ganesan, 1994), ECFs may behave in an opportunistic manner and this may contribute to the lack of confidence in ECFs from the perspective of service receivers. On the contrary, the opposite proposition which asserts the positive effect of FR on relational capital was accepted ($\gamma_2' = 0.15$, $p < 0.01$). The finding says that FR may help ECFs acquire relational capital skills. The rationale for the influence of FR on the stakeholder behavior may be derived from

information economics, specifically the signaling theory (Wernerfelt, 1988). As the signaling theory suggests, FR can inform external constituents about the trustworthiness, credibility, and quality of the firm. Therefore, it can be a key driver of external constituents' positive reactions toward a firm *vis-à-vis* its competitors (Galbreath, 2005). In harmony with this statement, Wang (2014) found that FR positively affects relational capital. Similarly, Dolphin (2004) claimed that FR has a key role to play in the development of organizations' relational strategies. As a result, it may be claimed that FR-backed confidence in ECFs grows strong relational capital. Based on this result, a possible relationship between relational capital and MI might be intuitively proposed. However, relational embeddedness that is characterized by emotional closeness and inter-personal trust may not result in a successful MI process (Musteen *et al.*, 2010). On the contrary, weak ties may be more beneficial than strong ties, since weak ties are likely to be more helpful in the identification of new opportunities (Hite and Hesterly, 2001). Although relational embeddedness is, of course, an important factor in the MI process (Forsgren, 2016), it may indirectly affect MI through its positive impact on the outcome of innovation because of the close knowledge-based interaction among the parties (Moran, 2005). Lastly, it can facilitate learning by promoting the free exchange of knowledge (Dhanaraj *et al.*, 2004), and thus, can indirectly enhance the sustained competitive advantages in the firm performance through the firm's knowledge management capabilities (Dezi *et al.*, in press).

H3 which hypothesizes a positive relationship between structural capital and FR was accepted. According to the finding, ECFs that have strong structural capital displayed a positive impact on FR ($\gamma_3 = 0.59$, $p < 0.001$). As organizational know-how is probably the most significant structural capital in knowledge-intensive business services such as engineering consultancy, ECFs that have an advantage over structural capital may be known for a good FR. In this context, some particular elements of structural capital (e.g. technical capabilities and procedures) may enable ECFs to develop and extend their recognition among potential stakeholders. In this respect, Nitithamyong and Tan (2007) determined the establishment of standard procedures as one of the underlying ECF success factors.

5.2 Effect of firm reputation on market internationalization

As Figure 2 illustrates, *H4* that hypothesizes a positive relationship between FR and MI was accepted. The finding shows that a good FR would positively influence MI ($\beta_1 = 0.57$, $p < 0.001$). As an expected result, this is in line with the propositions of Perrigot *et al.* (2004), Zyglidopoulos *et al.* (2006), Mariz-Perez and Garcia-Alvarez (2009), Moedas *et al.* (2012) and Javalgi and Grossman (2014). Based on the fostering effects of human and structural capital as found in this current research, a good FR of an ECF may easily have a positive impact on and activate domestic stakeholders such as clients, main contractors, subcontractors, designers and dealers. In doing this, such an FR that depends on a number of factors (e.g. high-quality employees, strong technical knowledge, the use of advanced technologies, and specific procedures and processes) may create a perception of the institutional value and quality on stakeholders. Therefore, these local stakeholders may be willing to work with both an ECF and its business partners (i.e. contractors, architects, equipment/material suppliers, and vendors of information and communication technologies). This, in turn, will likely result in constant international business flows for the ECF and the partners. Once FR is established in a host market, profit will probably come subsequently (Abdul-Aziz *et al.*, 2013). It means that a good FR may provide a long-lasting competitive advantage for an ECF because of the fact that FR is a valuable source that cannot be imitated easily and inexpensively. Similarly, FR drives born global firms' brand as well (Zahra *et al.*, 2003). Born global firms can mostly benefit from harnessing the brand image, and thus, enhance their international expansion (Efrat and Asseraf, 2019). However, especially for born globals from developing countries, more time and effort may naturally be required to overcome their

lack of FR, which is critical to their businesses (Jin *et al.*, 2018). In harmony with this interpretation, Zhao *et al.* (2011) identified well-known brand and goodwill as a strength of foreign ECFs in China.

6. Conclusions

Goals of the present study were to demonstrate the impact of IC on implementing FR and to explore the relationship of FR on ECFs' MI efforts. This is because neither the relationship between FR and the three elements of IC nor the relationship between MI and FR has been investigated empirically from the ECFs' point of views. Hence, an ECF may achieve a convenient fit between IC and FR and this causes new contracts in the international arena.

Considering aforementioned findings about impacts of IC on FR, ECFs that have adequate human and structural capital may possess a good FR, while ECFs with an advantage of relational capital may not be known for a good FR. However, they may have strong relational capital through FR. Thus, ECFs which plan to have a good FR in achieving advantages of relational capital should be aware of the fact that potential advantages of relational capital may not contribute to FR, although it has a vital aspect for many ECFs because of the service- or communication-intensive nature of the engineering consultancy industry. Finally, given the impact of FR on MI, FR seems to be a potential driver in ECFs' MI efforts, as hypothesized above.

6.1 Implications and limitations

This study specifically indicates the importance of IC and FR in obtaining a successful MI process. In other words, such a research effort can have a vital role to emphasize the significance of high value-added international knowledge-intensive businesses that should focus both on IC capabilities and on IC-driven FR. Since this kind of business, such as engineering consultancy, is more rarely active in developing countries compared to its counterpart in developed countries, the current research was conducted in Turkey as an instance of developing countries. The examination of association between these three constructs may eliminate the theoretical gap and help the IC literature to enrich, because there exist a few studies in the domain of knowledge-intensive business services. Hence, researchers may pay attention to the current study because of original relationships it developed. Although it is inevitable to evaluate single relationships in the conceptual model, it is clear to investigate the relationships as a whole. The findings achieved suggest that MI may be obtained by means of strong human and structural capital and a good FR.

This study's first contribution to research lies in the innovative design of the theoretical model where IC, FR and MI were first connected together. The second contribution is the original relationship between FR and the three elements of IC. This was empirically investigated for the first time. The third one is the relationship between MI and FR, which was first examined empirically for knowledge-intensive companies. Therefore, the research provides an implication for research. The hypothesized model presents an original conceptual framework to understand the drivers behind MI. However, it is fuzzy how other sectors and geographical areas would affect the findings. The model focused on the Turkish engineering consultancy market. IC elements and FR may show very different features, as sector and area change. Thus, subsequent researches may investigate how findings vary according to other markets and regions. Potential works will probably provide opportunities to point out sectoral and geographical differences and to see the entire picture of findings, and thereby, to comprehend effective drivers of MI in various conditions.

As this empirical research focuses on the MI process of ECFs, the theoretical framework developed may be analyzed for other knowledge-intensive business services. Therefore, the results may give a general position of the engineering consultancy industry. Otherwise, the

explanation of present findings for this industry must be made carefully. In this respect, how ECFs' perceptions of interrelationship vary over time may be examined.

The conceptual framework is far from presenting the end result. Future studies may be performed to examine the causes behind supported and declined interactions between constructs. Moreover, different constructs and items that may have an impact on MI may be included in the framework. For instance, financial performance, competitive strategies and external/internal risk factors may be added to the model.

The current study also presents practical implications. The results may serve industrial practitioners as a general guide to take into account and apply the requirements of IC and FR for MI. The paper also introduces useful information for executive directors to pinpoint the corresponding areas and take preventive measures. This constitutes an exact instrument for ECFs to enter the international market. In this respect, executive directors may concentrate highly on the improvement of human and structural capital. Thus, they may draw IC-based FR strategies.

The study has a social implication as well. ECFs which are active in the international market may hinder unemployment by means of their human capital, keep the financial sustainability by means of their high value-added works, and thereby, have a constructive impact on society. Consequently, these better conditions may lead to a prosperous society and healthy business atmosphere.

Lastly, the research contains two limitations. First, considering the amount of constructs in SEM, the data of this study were compiled from a low number of ECFs. Therefore, a larger group of samples could present a completely different perspective. Second, in interpreting causal relationships in SEM, multivariate normality of the data is assumed. In other words, the linear analysis of SEM leads to overgeneralization, although the reality is seldom linear. However, there is no doubt that each methodology has its own particular conditions and restrictive assumptions. These limitations should be taken into account in explaining the outcomes.

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