The Impact of Contextual Factors on Improving the Relational Intangible Capital Related to the Supply Chain: An Empirical Analysis within the Tunisian Context

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Abstract *The relational intangible capital has become an important determinant of value creation in manufacturing. Hence, comes the importance of studying the factors that may affect this relational capital in the supply chain. The following research applies the contingency theory to try to improve our understanding of the factors that may explain the features improvement of relational capital with the suppliers. We have examined, particularly, the impact of the five following contingency factors: the perceived environmental uncertainty, the relational capital with suppliers, the generic cost leadership strategy, the organizational architecture and the company size on the improvement of the features of relational intangible capital with the suppliers. The results show that only the variables: perceived environmental uncertainty and the relational capital with suppliers have a positive and significant effect on the features improvement of relational intangible capital with the suppliers.*

Key words Intangible capital, strategic buyer-supplier relationships, contingency theory, perceived environmental uncertainty, relational capital with suppliers

1. Introduction

In recent years, Competitive pressures have encouraged intangible investment in relational capital and the development of inter-firm strategic relationships as a general business strategy (Ramcharran, 2001; Koufteros *et al.,* 2007; Perona and Saccani, 2004). These relationships take place to help companies to compete against their competitors on service, quality and costs (Perona and Saccani, 2004).

In fact, companies have realized the importance of breaking the internal partitions and open the borders of their business to their partners within the context of developmental cooperation. The paramount object is henceforth to optimize the relational intangible capital and to improve the features of strategic relationships within the supply chain in order to achieve value creation and improved business performance (Pichot, 2006).

However, the accumulation of such a capital and the improvement of the characteristics of such a relationship are not as easy as it was thought and it presents a great challenge for the partners. Thus, it is necessary to examine the antecedents that explain the difference at the level of improving the relational intangible capital features between different firms.

The scarcity and the importance of studies, concerned with the impact of the contextual factors on the relational intangible capital in Tunisian companies are the main motivations of this research. Indeed, Tunisian companies are currently undergoing a new economic environment change along with political turmoil. Indeed, they are facing fundamental changes in the economic environment. Therefore, they should incorporate new ways of management so as to anticipate the environmental changes and to manage

uncertainty and to get used to it. Consequently, they are compelled to improve their inter-firm strategic relationships, especially with the suppliers to maintain and to face the competitiveness.

We will then try to contribute to the development of a contingency model that explains the variation at the level of intangible relational capital, by examining the impact of a number of contingency variables on improving the characteristics of strategic buyer-supplier relationships, which we call SBSR, as an intangible capital within the supply chain.

The main goal of this research paper is to explain the impact of the following five contingency factors, namely the perceived environmental uncertainty, the relational capital with suppliers, the generic cost leadership strategy, the organizational architecture and the company size on improving the characteristics of SBSR intangible capital within the supply chain.

In what follows, we will present first, the theoretical framework that leads us to the hypotheses to be checked. We then will present the research methodology and subsequently the results to be discussed and finally, we will draw a conclusion.

2. The theoretical framework and development of hypotheses

Lately, many companies have invested in the relational intangible capital or supplier's capital, placing the emphasis on the creation and the improvement of the characteristics of the strategic relationships with their suppliers in the supply chain as a mean to achieve a competitive advantage in the marketplace.

Indeed, inter-firm strategic relationship and the intangible capital have become important factors in manufacturing due to cost pressure and to the concentration of most of the companies on competence (Koufteros *et al.,* 2007).

These relations have become an important part of the organizational structure and the particular characteristics of an effective system will depend on the circumstances facing the company (Otley, 1980).

The contingency theory is essentially a theoretical perspective of an organizational behavior that emphasizes how contingency factors have affected the design and the functioning of organizations (Covaleski *et al.*, 1996).

In this respect, we will display our study finding taking into account, the effect of five contingency factors on improving the characteristics of intangible capital relating to the buyer - supplier strategic relationships (SBSR) in a supply chain. More specifically, these variables relate to the perceived environmental uncertainty, the relational capital with the suppliers, the generic strategy of cost leadership, organizational architecture and the size of the company.

2.1. Strategic buyer-supplier relationship within a supply chain as an intangible capital and its features:

Given the remarkable changes in the manufacturing industry, companies have started to think how to link up with each other within the supply chain framework in a way to generate more value for the customers and for themselves. Strategic business-suppliers relationships within the supply chain constitute a relational intangible capital that is classified as a component of immaterial or intangible capital that has been increasing of importance in the modern economy.

Indeed, intangible capital has become increasingly the main strategic asset of companies that develop and function for the benefit of the economic growth as a whole (OECD, 2006). These types of capital have revolutionized the process of creating value by forcing the update of the measurement methods and conceptual models of capital investment and of the return on investment. But most of them are not recognized in the financial statements (OECD, 2007). The importance of this type of intangible capital in the current economic climate is especially confirmed by the continuing growth at the level of intangible capital worldwide (Wali, 2009; Barkallah, 2010; Baklouti *et al.,* 2007; OECD, 2007).

Thus, given the quantitative importance of investments and intangible capital, it is essential to take them into account in the studies if we want to get a true picture of the economic growth (OECD, 2006; 2007).

Strategic business-suppliers relationships within the supply chain as an intangible relational capital with a set of characteristics were attributed great importance.

Indeed, the SBSR focuses on initiatives that enhance superior relational characteristics between the supply chain members and create a win -win situation for both buyers and suppliers (Paulraj and Chen, 2007).

Paulraj and Chen (2007) proposed three critical factors for this relationship, namely the limited number of suppliers, a long-term relationship orientation and inter-firm communication. However, these authors also indicated the need to include other factors such as confidence to present the complex-construct of the SBSR. Van der Meer-Kooistra and Vosselman (2000), Egan and Mody (1992) and Li and Lin (2006) also discussed the importance of trust as a characteristic of the SBSR. Thus, confidence in the search is added as a fourth feature of the SBSR within the supply chain framework. Several other researchers have also reported the financial aspect as an important characteristic of a relationship (Lee *et al.*, 2010; Dubois, 2003). For this, the financial aspect will be proposed as the fifth characteristic of an inter-firm relationship.

To underpin the domain of strategic buyer-supplier relationship, a brief literature and theoretical foundation for these features is presented below.

"*Increasingly, companies are emphasizing working closely and co-operatively with a limited number of suppliers that are trustworthy rather than using the traditional, arms-length, adversarial mode of conducting business with a large number of suppliers. Researchers have documented that this relational contracting approach is a required element of strategic buyer–supplier relationships. Apart from increasing trust and relational reliability, this approach provides benefits including (1) fewer suppliers to contact in case of orders given on short notice, (2) increased economies of scale based on order volume and the learning curve effect, (3) dedicated capacity and (4) better customer service and market penetration.*

In addition, an increasing number of suppliers have opted for long-term contracts and many suppliers tend to provide more information regarding their processes, quality performance and even cost structure to the buying firm. Such close relationships mean that channel participants share risks and rewards and are oriented for long-term relationship. It is suggested that companies gain benefits by placing a larger volume of business with fewer suppliers using long-term contracts. In addition, through a long-term relationship, the supplier will be part of a well-managed chain" (Paulraj and Chen, 2007).

"*Effective inter-firm communication can be characterized as frequent, genuine, and involving personal interaction between buying and selling personnel. Numerous researchers have found that when buyers and suppliers communicate and share information relating to materials procurement and product design issues, they are more likely to (1) improve the quality of their products, (2) reduce customer response time, (3) reduce the costs of protecting against opportunistic behavior and (4) improve cost savings through greater product design and operational efficiencies*" (Paulraj and Chen, 2007).

Trust is also seen as an important variable for the explanation of the origin, formation and growth of linkages in a supply chain (Van der Meer-Kooistra and Vosselman, 2000). And will have a lasting effect on the competitiveness of the supply chain (Paulraj and Chen, 2007). Trust involves a moral contract and a long-term commitment that reflects a condition of mutual dependence where both parties (buyer and supplier) are in a position to influence each other by their behavior. Manufacturing companies find that trust is an important aspect of the relationship as it facilitates the exchange of information. It also encourages each side investments for which no immediate income is guaranteed. In addition, it allows partners to adapt to unexpected contingencies. If the buyer and the supplier work for the benefit of each other, over time a system of accountability and mutual trust develops (Egan and Mody, 1992; Van der Meer-Kooistra and Vosselman, 2000). Trust must also be developed to encourage the disclosure of sensitive information to partners of the relationship (Daugherty *et al.*, 2006).

Finally, Damperat (2005) suggests that the economic dimension is the founding principle of any business and strategic relationship. The latter is characterized by material and cash flows. Thus, it is important to reduce transaction costs through strategic relationships with partners to ensure efficient exchange relationships. Lee *et al.* (2010) also state that strategic alliances provide several economic and financial benefits. For his part, Dubois (2003) suggests that sound strategic relationship between the company and its suppliers can lead to benefits in terms of reduced costs in the production process and material flows.

Besides, high transfer costs urge the company to adopt a relational attitude and engage in a long term relationship (Benamour and Prim, 2000).

2.2. Assumptions

To explain the difference in improving the features of relational intangible capital, we adopted the contingency theory to demonstrate how variation in improving features of this capital is associated with a number of contextual variables. Thus, in what follows, we will put forward all the hypotheses of this research.

2.2.1.   The perceived environmental uncertainty

Intensified global competition urged many companies to create collaborative partnerships with suppliers and other companies within the supply chain. The aim of these partnerships is to offer products at lower costs and higher quality with greater design flexibility. In addition, unpredictable changes in environmental lead companies to create an agile supply chain to provide a prompt response to these changes (Elmuti, 2002; Lai *et al*., 2004).

Accordingly, Ragatz *et al.* (2002) mentioned that in a highly competitive environment, suppliers constitute an increasingly important resource for manufacturers.

For this to happen, companies have taken bold steps to break down intra and inter-firm barriers to soften the environmental uncertainty and increase control of the supply and distribution channels (Maloni and Benton 1997).

Bergadaà et al. (1999) also mentioned that the globalization of markets and deregulation as well as intensified competitive rivalry between firms urged them to develop strategic advantages by establishing long-term relationships.

In addition, Wu and Cavusgil (2006) reported that companies join into a partnership to cope with the market and the environmental changes.

Therefore, we can expect that the perceived environmental uncertainty (PEU) encourages companies to improve the characteristics of intangible capital (SBSR) within the supply chain to better control this environment and enjoy the benefits of collaboration. For this, the following hypothesis is to check:

H1: The perceived environmental uncertainty has a positive effect on improving the features of intangible capital SBSR within the supply chain.

2.2.2. The relational capital with suppliers

The theory of social capital constitutes an important perspective to theorize the nature of the relationship between organizations (Carey *et al*., 2011; Lawson *et al*., 2008). Indeed, Nahpiet and Ghoshal (1998) proposed three dimensions of social capital, namely the relational capital, the cognitive capital and the structural capital. Particularly, social capital refers to the trust, accountability and identification present in the relationships between people (cited by Carey *et al.* 2011) resulting from a history of interactions (Lawson *et al.,* 2008). Thus, social capital refers to assets that are embedded in relationships of trust, duty, friendship and reciprocity (Lawson *et al*., 2008; Spaienza and De Clercq, 2006).

Carey *et al.* (2011) also reported that trust is a component of social capital. As a provision of welfare between the actors, the trust has been articulated as a characteristic of SBSR in the supply chain. Also, the relational capital improves performance of the relationship by reducing the pending opportunistic behavior increasing the confidence of both sides and reducing transaction costs (Dyer and Singh 1998 as quoted by Carey *et al*., 2011).

Thus, we can deduce from what has been argued so far, that social capital entails increased confidence and reduced transaction costs which are two important characteristics of SBSR within the supply chain.

Furthermore, according to Villena *et al.* (2010) through repetitive buyer-supplier transactions, the parties have proven credibility and maintained standards friendship and reciprocity of the relationship and building a strong long term relationship. Also, when trust is built through repetitive transactions, the parties tend to be less concerned with the opportunistic behavior of others and are more able to engage in open communication.

Thus, these authors have highlighted three important features of SBSR within the supply chain that may be affected by the relational capital, namely a long term relationship, trust and free communication between companies.

We can expect that relational capital with the suppliers can help manufacturing companies to improve the features of their SBSR intangible capital within the supply chain by increasing trust, long-term relationship

and communication and reducing transaction costs. Thus, it seems interesting to propose the following hypothesis:

H2: The relational capital with suppliers has a positive effect on improving the features of SBSR intangible capital within the supply chain.

2.2.3. The generic strategy of cost leadership

Jermias and Gani (2004) reported that Porter (1985) argues that the company must derive its sustainable competitive advantages either by following a strategy of cost leadership or by setting a differentiation strategy.

Competitive strategy can be seen as an important preceding factor to improve the features of SBSR intangible capital. Indeed, on the one hand Langfield-Smith (1997) reports that the strategy of cost leadership entails that the organization aims to become the lowest cost producer in its industry. The source of this competitive advantage can arise from many factors such as; economies of scale, access to favorable raw materials prices and a cutting-edge technology. Thus, this strategy functions through the low cost competitive advantage (Shlie and Goldhar. 1995).

On the other hand, Elmuti (2002) and Maloni and Benton (1997) reported that stiff competition urged several organizations to create mutually beneficial partnerships or strategic relationships with suppliers. The goal of these partnerships is to offer products at lower costs and higher quality with greater design flexibility.

Dubois (2003) also suggests that sound strategic relationship between the company and its suppliers are assumed to result in cost benefits in terms of reduced costs during the production process and material flows.

From what has been put forward, it seems evident that the strategic relationship between the company and its suppliers targets the same objective of the cost leadership strategy, which is the reduction of the costs of production processes and material flows while ensuring a higher quality product. Thus, we expect that companies following this strategy carry out improvements of the characteristics of their intangible capital SBSR within the supply chain to achieve the goal of cost reduction through economic negotiations between company and its supplier- partner to add value and reduce the costs of raw materials. Hence, we propose to check the following hypothesis:

H3: The strategy of cost leadership has a positive effect on improving the features of SBSR intangible capital within the supply chain.

2.2.4. Organizational architecture

The organizational architecture is defined through three dimensions: the allocation of decision rights (centralization or decentralization) and the control systems composed by an evaluation system of performance and an incentive system (Catelin, 2003).

Brickley *et al.* (2002) report that designating organizational architecture, the CEO faces three alternatives. First, he can opt for the centralization of the rights using simple control systems. Second, the CEO may attempt to acquire the relevant information to make better decisions. Third, the CEO may choose to decentralize decision rights, but with keeping a complex control systems.

The organizational architecture with centralized decision-making rights and simple control systems tends to restrict the flow of information to the prescribed channels. This is suitable for an organization operating in a tedious environment where solutions and fixed procedures are identified beforehand (Gul and Chia, 1994).

Thus, it really seems that such an organizational architecture is not consistent with the inter-firm relationships that may cause non-routine transactions and ask for more frequent and detailed checks and controls.

However, through a decentralized organizational architecture using complex control systems, an organization is able to provide its managers with greater responsibility and control over the activities (Gul and Chia, 1994).

This specific form of a decentralized organizational architecture with frequent and complex control systems seems to be more suitable for the control and the improvement of features of the SBSR intangible

capital within a supply chain framework than the organizational architecture with centralized decision rights and simple control systems.

Given what has been put forward, it seems logical to propose the following hypothesis:

H4: The organizational architecture of a company has a positive impact on improving the features of SBSR intangible capital within the supply chain.

2.2.5. The company size

Jiang and Gao (2008) report that the firm's size affects the stability of the SBSR. Indeed, large companies have more flexibility to allocate resources to the strategic activities of the supply chain than the small companies. Large companies can also hold more weight in their relations with the suppliers, while a small company may be unable to convince its suppliers to adopt a position of cooperation and may lack the skills and resources to develop trade collaboration. In addition, large companies can invest more resources (financial and human) to improve the characteristics of the relationship with suppliers.

Thus, we can conclude that large firms are more likely to make improvements in the features of SBSR intangible capital.

However, other studies report a sense quite contrary to the foregoing. In particular, Wu and Cavusgil (2006) state that companies with limited resources will find it beneficial to join into partnership with another company to have access to resources and social opportunities which they need to accomplish a better performance. In fact, collaboration and in particular, the strategic Buyer-supplier relationship will provide opportunities for small businesses to learn from its partner the know-how and the critical skills for a competitive advantage. Street and Cameron (2007) also state that small firms are more likely to form cooperative arrangements than larger firms.

This reasoning entails that a small company has more interest to enter into a strategic relationship with its suppliers and improve the features of this relationship than a large company.

Therefore, arguments differ and the expectations diverge. Hence, it seems interesting to check the following hypothesis:

H5: The size of the company has a positive effect on improving the features of SBSR intangible capital within the supply chain.
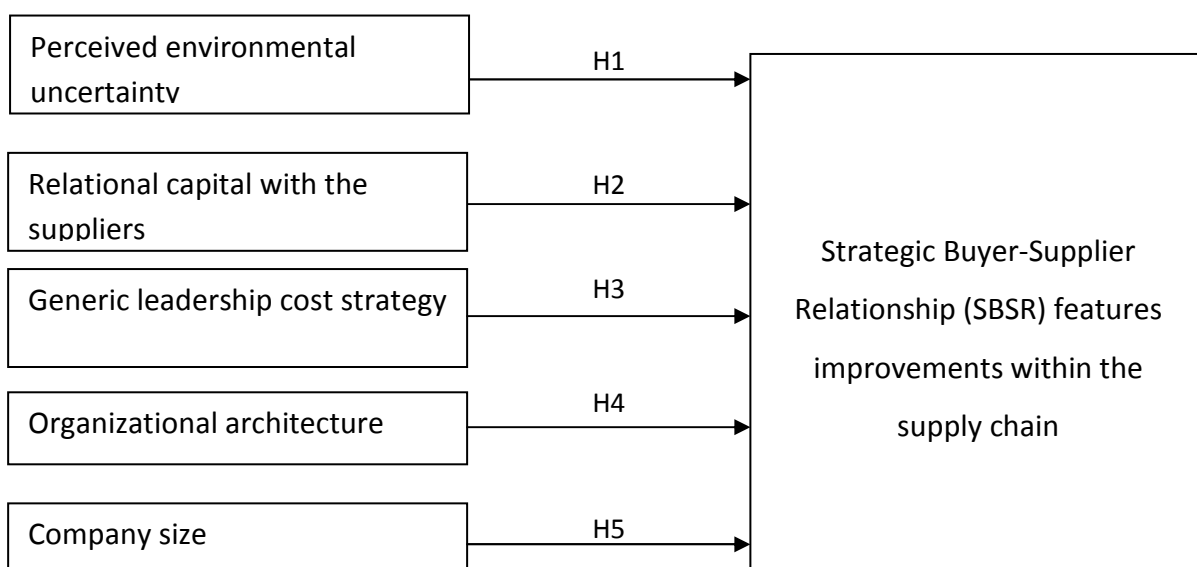
Thus, our conceptual model is as follows:

Figure 1. The conceptual model of the relationships between the contingency factors and the SBSR intangible capital features improvement

3. The research methodology

In what follows the paper presents first; the instruments used, the description of the sample and the adopted method of data collection.

3.1. The operationalization of variables

To generate items that can measure our findings, we referred firstly, to the theory and secondly, to discussions with some professionals to generate some other items and guide others inspired by the theory, since the variety of contexts .

In what follows, we propose to define the variables of our research.

In this research, to measure "the perceived environmental uncertainty", we have used the instrument used by Gordon and Narayanan (1984), which consists of ten questions, ranged on the Thurstone seven-points scale to indicate, the predictability of external business environment that relates to competition, innovative products in the industry, economic and technological environment, the predictability of competitors, predictability of customers preferences, regulatory constraints and the emergence of scientific discoveries.

Regarding the variable "relational capital with the suppliers", it is measured (on a 7-point Likert scale with end points from 1= strongly disagree to 7= strongly agree) by five items related the close interaction, trust, respect, friendship and mutual reciprocity between the company and its key suppliers (Lawson *et al.*, 2008; Spaienza and De Clercq, 2006; Villena *et al.*, 2010).

Measuring the variable "generic strategy of cost leadership" consists of seven questions (measured on a 7-point Thurstone scale with end points from 1 = no emphasis to 7 = very high emphasis) to indicate the accentuation of the strategic priorities of cost minimization by the company. These seven items are mainly: reduced production cost, reduced selling prices, minimized variables costs by virtue of the experience curve, the minimization of fixed costs per unit by the effect of the experience curve, the elimination of waste, the use of routine tasks and the production of standard products (Langfield-Smith, 1997; Porter, 1980).

To measure the variable "organizational architecture" we referred to the study of Bouslama (2010). This variable is a three-dimensional second-order construct. The first dimension, which is decentralization of decision-making rights is measured (on a 7-point Thurstone scale, ranging from 1 = none to 7 = complete delegation), by the size of the delegation of the four classes of decision-making rights to managers and to appropriate subordinates. The whole set of decision-making rights is as follows: The rights of taking the initiatives to generate proposals for the use of resources and structuring of contracts, ratification's rights of the initiative decisions implementation choice, ratified decisions implementation rights and monitoring and control rights of the stuff by measuring their performance and rewards implantation. The average Score of the respondents was used as a composite measure of the level of decentralization of decision-making rights. The upper end of the scale indicates a complete decentralization of decision-making rights and the other end indicates a centralization of these rights. The second dimension that relates to the mechanisms of performance evaluation, is measured on a 7-point scale with end points from 1 = never to 7 = very often, by the frequency of use of a set of these mechanisms in the firm. Items that constitute this dimension are benchmarking, the completion percentage of targets, the new customers number, the collective performance, the satisfaction of the hierarchy, the level of subordinates' involvement, the number of services rendered, the customer satisfaction, the total margin achieved and the number of defaulting customers. Finally, the third dimension, which is the subordinates' incentive and reward system is measured, on a 7-point scale with end points from 1 = never to 7 = very often, by the frequency of use of a set of incentive systems in the enterprise. Items that constitute this dimension are as follows: a special discount price, travel, promotion, bonus or individual incentives, a reward for accomplished challenges, a bonus or collective rewards, shareholding and incentive payments. Score average of the respondents is used as a composite measure of the frequency of use of incentive and reward systems of subordinates.

On what concerns, the "size of the company" variable we measured it by the number of the employees that constitute a number that signifies the same thing in all countries (Swamidass and Kotha, 1998). We have chosen the classification of Lampercht (1996), which ranks companies according to the number of employees in five classes.

Finally, "the characteristics improvement of SBSR intangible capital within the supply chain" variable is a second order construct, which measurement is related to five dimensions. These five dimensions are namely, a limited number of suppliers, long-term relationship orientation, inter-firm communication, trust

and the financial aspects of the relationship. They are measured on a 7-points Likert scale with end points from 1 = not at all agree to 7 = Strongly Agree (Paulraj and Chen, 2007).

Items tapping the construct ''Limited Number of Suppliers'' measure the extent to which firms increasingly emphasize close, relational contracting with a smaller number of dedicated suppliers.

The construct ''Long-Term Relationships Orientation'' is operationalized by indicators reflecting the extent to which the buying firm (a) expects its relationships with key suppliers to last a long time, (b) works closely with key suppliers to improve product quality, and (c) views the suppliers as an extension of the company; in turn, (d) suppliers see their relationship with the buying firm as a long-term alliance.

''Inter-firm Communication'' is operationalized to include the extent to which the firm and its key suppliers (a) share critical, sensitive information related to operational and strategic issues, (b) exchange such information frequently, informally and/or in a timely manner, (c) maintain frequent face-to-face meetings and (d) closely monitor and stay abreast of events or changes that may affect both parties'' (Paulraj and Chen, 2007).

Trust dimension measures the extent to which: (a) Employees of the purchasing company and those of the key suppliers tend to trust each other, (b) There is no information asymmetry between the company and its key suppliers, (c) There is a possibility of skills and knowledge transfer, (d) There is a risk-taking reduction concerning the implementation of the commitments by key suppliers and (e) company employees and those of the key suppliers negotiate or deal fairly with each other.

Finally, the relationship dimension of the financial aspect is operationalized by the following items: The relationship with key suppliers enables reduction of (a) significant transfer cost, (b) production cost and (c) commercial transactions cost.

3.2. The description of the sample

The sample contains 100 industrial enterprises operating in different Tunisian business areas and scattered over different regions of Tunisia are Tunis, Ben Arous, Nabeul, Zaghouan, Sousse, Monastir, Gabes, Sfax and Beja.

3.3. Data collection

The data collection tool for our investigation is a face-to-face and an online questionnaire.

This questionnaire is composed mainly of closed-ended multiple choice questions and relates to three axes. The first axis is the presentation of the company profile. The second relates to the improvement of the characteristics of SBSR intangible capital. And the third relates to the contingency factors.

The questionnaire was tested before being communicated to the companies surveyed. To test this, we conducted a pre- survey of some companies belonging to our sample. The information gathered during the pre-survey allowed the evaluation of the relevance of the issue, different measures' adaptation to the Tunisian context and the development of the final questionnaire.

The Phase of data collection allowed us to gather one hundred questionnaires. In particular, out of 300 questionnaires sent via the Internet, we were only able to recover 18 questionnaires with a response rate for this type of data collection of 6%. While for data collection through face-to- face tool, we distributed 150 questionnaires and we could only recover 96 questionnaires with a response rate of 64%. Some of the observations which were not completely filled were removed which led to a reduction of the number of observations from 96 to 82. This is due to the fact that many managers have not wished to communicate financial and accounting information under the pretext of confidentiality. Note also that some officials preferred to answer the questionnaire on their own because of their occupations or for other reasons.

The majority of respondents belong to the accounting department, financial and general management. In fact, we interviewed 35 accountants, 31 administrative and financial directors, 20 Chief Executive Officers, four purchasing managers and 3 human resource managers.

Data collection lasted nine months. It started in May 2011 and ended in January 2012.

3.4. Methods of data analysis

First, we had recourse to the Principal Component Analysis (PCA) using the SPSS18 software to ensure that the chosen items produce a perfect representation of the constructs. During this phase, we had to use the methodology of Churchill (1979) and the criteria of purification measures proposed by Evrard et al. (2003).

Then, we used AMOS18 software to make a confirmatory factor analysis to determine the internal consistency and the convergent and discriminant validity of the measurement scales. Second, a confirmatory factor analysis of second -order is used to determine the internal consistency of the first-order factors measuring constructs "organizational architecture" and "improvement of the characteristics of SBSR intangible capital". During the CFA of second-order, items that remained at the PCA phase are used as first-order factors indicators, which in turn are used as second – order constructs indicators (Akrout, 2005; Lacroux, 2009, Roussel *et al.*, 2002; Hair *et al.*, 1998).

Finally, using the SPSS18 software, we applied a multiple linear regression on the resulting factors to confirm or refute the hypotheses of our research.

4. The analysis and interpretation of research results

Prior to the interpretation of results, it is necessary to purify, confirm and validate our measurements to improve the interpretation of results.

4.1. The Presentation of the measurements' purification results

The Purification of the measuring instruments was made via two different tests, namely dimensionality and reliability tests. Dimensionality test was carried out by a principal Component Factor Analysis (PCA) of the variables' measuring scales. The reliability analysis was completed on the remaining items from the first analysis, using Cronbach's alpha coefficient (Churchill, 1979; Nunnally, 1978).

In fact, the PCA made on the research variables, allowed us to establish three one-dimensional variables which restore a satisfactory total variance (> 50%), a three-dimensional variable (organizational architecture) and a four-dimensional variable (improvement of the characteristics of SBSR intangible capital) (see table 1).

Note that for the construct "organizational architecture", we identified two factors related to incentive and reward systems ,whose second factor was eliminated from the analysis because of unsatisfactory reliability, a factor constituting the performance evaluation mechanism and a factor that includes items of the decentralization of decision-making rights and other items of the performance evaluation mechanisms to form together a single factor called "decentralization of decision- making rights and performance evaluation mechanisms". As for the construct "SBSR intangible capital features improvements" the PA phase eliminated the long-term relationship orientation dimension because of the factors' low loadings.

Table 1. Validation of the variables' measuring scales

Research variables	Code	Dimensionality and % of the explained variance	Internal validity (αCronbach)
Perceived environmental uncertainty	PEU	One-dimensional 65.515% (1.965)	0.735
Relational capital with the suppliers	RCS	One-dimensional 74.274% (2.971)	0.882
Cost leadership strategy	CLS	One-dimensional 65.181% (1.955)	0.781
Organizational architecture	OA: Decentralization-evperfsys EvPerfSystem IncentiveSystem	3 dimensions 60.391% 24.81% (3.722) 20.412% (3.062) 15.169% (2.275)	0.868 0.940 0.789
The company size	size	Measured by the number of employees	Measured by the number of employees
SBSR intangible capital features improvements within the supply chain	SBSRFI: -Inter-firm communication -	4 dimensions 72.887% 26.678% (4.002)	0.889

financial aspect	18.705% (2.806)	0.927
-trust	16.024% (2.404)	0.776
-Limited number of suppliers	11.480% (1.722)	0.729

4.2. The presentation of the results of the confirmatory factor analysis (CFA)

A confirmatory factor analysis (CFA) was also conducted on the scales. This analysis shows that all variables have a fairly satisfactory internal consistency (ρ Jöreskog > 0.5) (Roussel *et al.*, 2002), an acceptable convergent validity (ρvc > 0.5) (Fornell and Larker, 1981) and a highly correlated items to their common factor and values of critical ratio above 1.96 (see table 2).

The CFA also confirmed the three-dimensional structure with critical ratio > 1.96 of the construct "organizational architecture". In addition, all items are highly correlated with their Common factors and the squared multiple correlations are acceptable. However, the CFA has reached a new three-dimensional structure for the construct "improvement of the characteristics of SBSR intangible capital". Indeed, the four-dimensional measurement model of this construct is not specified correctly since the relations of the fourth dimension "limited number of suppliers" with the latent variable associated with it are not significant. Furthermore, the factor loading of the item SBSRlns2 to the factor to which it belongs is an outlier because it is greater than 1 (Akrout, 2010). That is why; we eliminated the "limited number of suppliers" dimension.

A second-order CFA was also applied to the three dimensions of each construct (organizational architecture, improvement of the characteristics of SBSR intangible capital) after checking the passage conditions from the first-order factors to a second- order construct (the existence of a strong correlation between the first-order factors and the comparison of the first-order model to the second-order one in terms of data adjustment quality by means of the target coefficient Index calculation (TCI)) (Roussel *et al.*, 2002; Akrout, 2010). This analysis confirmed the strong contribution of each set of the three-dimensions to a second-order construct which is associated with it (organizational architecture and improvement of the characteristics of SBSR intangible capital). The measurement models have shown a rather satisfactory adjustment quality (see Table 3).

Thus, these tests allow testing our hypotheses Based on relevant data.

Table 2. Results of the CFA measuring scales variables

Research variables	Coeff Std	SMC	c.r (t)
The perceived environmental uncertainty (ρJöreskog= 0.744 ; ρvc= 0.497)			
- The extent of stability/dynamism of technological environment	0.838	0.379	7.323
- The degree of predicability of competitors market activities	0.639	0.408	5.869
- The frequency of the emergence of scientific discoveries in industry	0.616	0.702	5.687
Relational capital with the suppliers (ρJöreskog= 0.869 ; ρvc= 0.630)			
- A multilevel mutual trust	0.588	0.819	6.101
- A multilevel mutual respect	0.769	0.762	8.7321
- A multilevel mutual friendship	0.873	0.592	10.374
- A multilevel mutual reciprocity	0.905	0.345	10.924
X^2/ddl=0.879 (≤5) ; GFI= 0,996 (>0.9) ; AGFI= 0.956(>0.9); TLI=1(>0.9); CFI= 1 (>0.9); RMR= 0,013 ; RMSEA= 0,000; BIC=24.325 Ms (46.052)			
Generic cost leadership strategy (ρJöreskog= 0.860 ; ρvc= 0.674)			
- A reduced production costs	0.676	0.688	6.110
- A reduced selling prices.	0.576	0.332	5.341
- Minimization of the variables cost per unit by the impact of the experience curve (volume effect)	0.830	0.456	7.192
Organizational architecture **1- Decentralization of decision rights and performance evaluation mechanisms (ρJöreskog= 0.880 ; ρvc= 0.514)**			
- The rights of taking the initiatives to generate proposals for the use of resources and structuring of contracts	0.711	0.498	7.869
- Ratifications rights of the initiative decisions implementation choice.	0.622	0.382	6.608
- Implementation's rights of the ratified decisions.	0.722	0.519	8.034

	Coeff Std	SMC	c.r (t)
- Targets' achievements percentage	0.651	0.433	6.998
- Number of new customers.	0.687	0.479	7.517
- Customers' satisfaction	0.871	0.764	10.734
- The achieved Total margin	0.731	0.540	8.167
2- Professional performance evaluation mechanism (ρJöreskog= 0.942 ; ρvc= 0.844)			
- collective performance.	0.921	0.842	11.981
- hierarchical satisfaction	0.921	0.851	11.892
- Subordinates level of involvement	0.910	0.824	11.638
Following of table 2 :			
Research variables	**Coeff Std**	**SMC**	**c.r (t)**
3- Incentive and individual reward systems (ρJöreskog= 0.793 ; ρvc= 0.563)			
- A promotion	0.657	0.435	6.628
- A bonus or an individual incentive	0.823	0.768	8.541
- A reward for accomplished challenges	0.762	0.581	7.836
X^2/ddl=1.596 (≤5) ; GFI= 0,872 (>0.8) ; AGFI= 0.810 ; TLI=0.938 ; CFI= 0,952 (>0.9) ; RMR= 0,145 ; RMSEA= 0,078; BIC=235.492 Ms (419.070)			
The SBSR intangible capital features improvements **1-Inter-firm communication (ρJöreskog = 0.896 ; ρvc = 0.594)**			
- We share sensitive information with key suppliers.	0.568	0.322	5.936
- Suppliers are provided with any information that might help them.	0.785	0.616	9.088
- Exchange of information takes place frequently, informally and/or in a timely manner	0.765	0.586	8.765
- We keep each other informed about events or changes that may affect the other party.	0.890	0.793	11.060
- We have frequent face-to-face planning/ communication	0.781	0.610	9.032
- We exchange performance feedback	0.797	0.635	9.296
2- The financial aspect of the relationship (ρJöreskog = 0.929 ; ρvc = 0.813):			
- The relationship with key-suppliers allows important transfer cost reduction	0.878	0.772	11.020
- The relationship with our key-suppliers allows production cost reduction.	0.892	0.796	11.193
- The relationship with our key- suppliers allows trade transaction costs reduction.	0.934	0.873	12.078
3-Trust (ρJöreskog = 0.784 ; ρvc = 0.478):			
- Employees in our company and those of our key- suppliers tend to trust each other.	0.731	0.534	7.791
- Absence of information asymmetry between our company and our key suppliers.	0.656	0.430	6.669
- A reduced risk-taking concerning the commitments achievement by our key-suppliers	0.759	0.575	8.020
- Employees in our company and those of our key suppliers negotiate or deal fairly with each other.	0.610	0.372	6.101
X^2/ddl=2.246 (≤5) ; GFI= 0,941 (>0.9) ; AGFI= 0.862 ; TLI=0.878 ; CFI= 0,904 (>0.9) ; RMR= 0,114 ; RMSEA= 0,092; BIC=275.133 Ms (419.070)			

Table 3. Second order CFA results of the first -order factors of the constructs « organizational architecture » and « SBSR intangible capital features improvements»

First-order Factors	**Coef.Std.**	**SMC**	**c.r (t)**
- Decentralization of decision rights and performance evaluation mechanisms.	0.677	0.459	4.405
- Professional performance evaluation mechanism	0.728	0.530	5.967
- Individual incentive and reward systems	0.782	0.612	5.399
X^2/ddl=1.596 (≤5) ; GFI=0,872 (>0.8) ; AGFI=0.810 ; TLI=0.938 ; CFI=0,952 (>0.9) ; RMR=0,145 ; RMSEA=0,078; BIC=235.492 Ms (419.070)			
- Inter-firm communication	0.677	0.459	4.405
- The relationship financial aspect	0.728	0.530	5.967
- Trust	0.782	0.612	5.399
X^2/ddl=2.246 (≤5) ; GFI=0,941 (>0.9) ; AGFI=0.862 ; TLI=0.878 ; CFI=0,904 (>0.9) ; RMR=0,114 ; RMSEA=0,092; BIC=275.133 Ms (419.070)			

The internal consistency of the global measurement model and its convergent validity are checked. Indeed, Jöreskog rho and the coefficients of the [Rho] convergence of the global measurement model are

satisfactory. In addition, discriminant validity is checked since all squared multiple correlation coefficients are inferior to the extracted average variance.

4.3. Results interpretation

After drawing a score factor for each variable in our study, we will present the checking results of our hypotheses, which state that there is a significant impact of the contingency factors on improving the features of strategic buyer-supplier relationship within the supply chain.

The utilization of multiple linear regressions is only possible after checking the application's conditions. For this purpose, we made the linearity test of the model, the multicollinearity absence tests between the explanatory variables, residuals normalty test and the test of lack of autocorrelation between the error terms and homosedasticity (constant variance) of the errors.

The results show that the inherent conditions in the regression method are verified. Thus, we can interpret the overall quality and the regression's coefficients.

4.3.1. The presentation of the model to be tested:

The following multiple linear regression model is used to check the hypotheses:

$$SBSRFI = \beta_0 + \beta_1 (PEU) + \beta_2 (RCS) + \beta_3 (CLS) + \beta_4 (OA) + \beta_5 (size) + \varepsilon \qquad (1)$$

With:

SBSRFI: a dependent variable to explain that correspond to to the improvement of the features of SBSR intangible capital within the supply chain.

PEU, RCS, CLS, OA and Size: Explanatory variables that correspond, respectively to the perceived environmental uncertainty , relational capital with the suppliers, the generic strategy of cost leadership, organizational architecture and the size of the company measured by the number of employees.

ε: The error term

β_0, β_1, β_2, β_3, β_4 and β_5: the coefficients of determination (weight) of the constant and independent variables in explaining the dependent variable.

4.3.2. The interpretation of the regression results

Empirical results in (Table 4) show that 29.2 % of the variation of the SBSR intangible capital features improvements is explained by the contingency variables of our research. The Fisher (F) statistic which equals (7,769), confirms the good quality of the model at a less than 1% significance level. Therefore, the explanatory power of the model appears to be satisfactory since the Fisher F statistic is significant at a 1 % level.

Thus, we reject the null hypothesis to state that the regression is significant as a whole and that the model is explanatory of the phenomenon. Concerning the significance of the independent variables, we can see that only "the perceived environmental uncertainty" variables and "the relational capital with suppliers" are statistically significant. While the "generic cost leadership strategy" variable, "organizational architecture" variable and "the company's size" variable are not.

The table 4 below summarizes the results of the regression related to the set of explanatory variables of the model. It displays the explanatory power of the model, the Beta coefficients, Student's t-test, the F statistic and its significance.

Table 4. Multiple linear regression results of the model

Explanatory variables	Coefficients	T- Student	Significance
Constant	0.868	1.707	0.091
Perceived environmental uncertainty	0.201	2.183	0.032*
Relational capital with the suppliers	0.266	2.121	0.037*
Generic cost leadership strategy	0.214	1.811	0.073
Organizational architecture	-0.015	-0.156	0.877

Company size	0.138	1.581	0.117
R^2= 29.2%			
Adjusted R^2=25.5%			
F=7.769 Sig 0.000			

Significant at a 5 % level

4.3.2.1.   The impact of perceived environmental uncertainty Analysis (H1)

The first hypothesis (H1) is used to check whether the perceived environmental uncertainty (PEU) has a positive effect on improving the features of SBSR intangible capital within the supply chain.

A review of statistical tests highlights that this variable has a positive and significant effect on improving the features of SBSR intangible capital within the supply chain. Indeed, a review of causal relations shows that the causal coefficient between the perceived environmental uncertainty and SBSR intangible capital features improvement is positive (0.201) and statistically significant (t = 2.183, p = 0.032). This confirms the predictions of the hypothesis (H1).

These results corroborate those found by Lai *et al.* (2004), Elmuti (2002), and Ragatz *et al.* (2002), Benton and Maloni (1997) and Koufteros *et al.* (2007)

Thus, the effect of perceived environmental uncertainty on improving the characteristics of SBSR intangible capital is shown. This leads us to conclude that the perceived environmental uncertainty encourages companies to improve the characteristics of SBSR within the supply chain in order to benefit from the collaboration and to deal with the environmental pressures.

4.3.2.2.   The impact of the relational capital with the suppliers (H2)

The second hypothesis (H2) states that relational capital with suppliers has a positive effect on improving the features of SBSR intangible capital within the supply chain. A review of statistical tests highlights that this variable has a positive and significant effect on improving the features of SBSR intangible capital within the supply chain.

The review of the causal effect shows that the statistical coefficient of the variable "relational capital with suppliers" has a positive value (0.266). The value of t is greater than 1.96 (t = 2.121, p = 0.037). Thus, H2 is corroborated.

These results corroborate the predictions of Carey et al. (2011) and Villena *et al.* (2010).

Thus, a company that has a large relational capital with suppliers based on mutual trust, friendship, respect, reciprocity and close interaction tend to improve the features of its SBSR intangible capital.

4.3.2.3.   The impact of cost leadership strategy Analysis (H3)

The third hypothesis (H3) states that cost leadership strategy has a positive effect on improving the features of SBSR intangible capital within the supply chain

Statistical tests show that the strategy of cost leadership has a positive effect but insignificant on improving the characteristics of SBSR intangible capital (beta = 0.214; t = 1.811 and p = 0.073). These results refute the third hypothesis (H3) although the objectives of the cost leadership strategy can be achieved by improving the features of SBSR intangible capital within the supply chain. This can be explained by the fact that even under a differentiation strategy, companies can proceed with improving the SBSR intangible capital features within the supply chain to achieve originality.

4.3.2.4.   The impact of organizational architecture Analysis (H4)

The hypothesis (H4) is used to check whether the organizational architecture has a positive effect on improving the features of SBSR intangible capital within the supply chain.

Indeed, a review of causal relations shows that the causal coefficient between organizational architecture and improving the features of SBSR intangible capital within the supply chain is negative (-0.015) and statistically insignificant (t = -0.156, p = 0.877). This refutes the predictions of the hypothesis (H4).

Therefore, the effect of organizational architecture on improving the characteristics of SBSR intangible capital is not demonstrated in our study. This leads us to conclude that companies tend or renounce improving the features SBSR of intangible capital regardless of their organizational structure.

4.3.2.5. The impact of the company size Analysis (H5):

The hypothesis (H5) is used to check whether the company size has a positive effect on the SBSR intangible capital features improvement within a supply chain.

A review of statistical tests shows that this variable has a positive but insignificant effect on the variation of the features improvement of SBSR intangible capital within the supply chain. Indeed, a review of causal relations shows that the coefficient associated to the link between company size and the SBSR intangible features improvement is positive (0.138) but not statistically significant (t = 1.581, p = 0117). This refutes the predictions of the hypothesis (H5).

These results do not confirm those found by Jiang and Gao (2008) and Koufteros et al. (2007), but they are consistent with the findings of Wu and Cavusgil (2006) and Street and Cameron (2007).

Thus, we can deduce that the large and small companies have almost the same likelihood to proceed with the SBSR intangible capital features improvement. It is true that large companies can invest more financial and human resources to improve the features of this intangible capital, but small companies with limited resources are more motivated to enter into relationship with another company to access to resources and opportunities they need to complete a higher performance and build competitive advantage.

Taking into consideration the results generated by our study, our model can be written as follows:

SBSRFI = 0.201 * (PEU) + 0.266 * (RCS)

5. Conclusions

In recent years, competitive pressures have encouraged the investment in intangible relational capital, the development of inter-firm relationships and the strategic management of the supply chain as a business strategy.

Indeed, investment in the intangible relational capital within the supply chain is seen nowadays as a process of adding value that directly sustain the primary goal of the company, which is the gain of competitive advantage. Besides, the strategic importance of the supply chain is increased. The competition is no longer an inter-firm competition but between supply chains and success is not measured by a single transaction. In several examples, the competition is evaluated as a network of cooperating companies that compete with other companies throughout the supply chain. To reach success, companies do not seek to achieve cost reductions or enhancements of their profit at the expense of their partners in the supply chain, but rather they seek to turn the supply chain as a whole into a more competitive system.

Thus, the feature improvement of SBSR intangible capital within the supply chain is currently an increasingly important objective for manufacturing companies.

However, improving the features of this capital varies between companies. As an attempt to explain and justify this variation, our research in this study is based on the contingency theory by arguing that this variation is due to several contextual contingency factors. In fact, we examined the effect of five contextual variables on improving the characteristics of SBSR intangible capital within the supply chain. In particular, these variables relate to the perceived environmental uncertainty (PEU), relational capital with suppliers, cost leadership strategy, organizational architecture and company size.

Thus, the whole set of causal links between the above variables and The SBSR intangible capital improvement features are reviewed in this study.

To conclude, we were able to identify that the variation at the level of SBSR intangible capital improvement features within the supply chain between companies is mainly due to the perceived environmental uncertainty and relational capital with suppliers. However, the variables "cost leadership strategy", "organizational architecture" and "company size" have no significant influence on "improving the features of SBSR intangible capital within the supply chain".

On what concerns the contributions of this research, it permitted theoretically, the summarization of previous studies dealing with the connections between contextual variables related to the company external and organizational features and SBSR intangible capital improvement features within a supply chain.

At the methodological level, we have tried to add other dimensions to measure the multidimensional construct of improving the features of SBSR intangible capital within the supply chain, following the recommendations of Paulraj and Chen (2007). Indeed, these two researchers have proposed adding dimensions such as trust and commitment. Thus, we added two dimensions, namely trust and the financial aspect of the relationship, in addition to the three dimensions used by Paulraj and Chen (2007). The results of our research demonstrated the importance of these two dimensions for the representation of such a complex construct.

Besides, we also note that this work has helped to contextualize and validate a number of scales borrowed from previous studies to the Tunisian context. Besides, the use of first and second order confirmatory factor analysis using Amos 18 software allowed to build and check the validity and reliability of latent constructs, made from a combination of several items and even several dimensions (measuring scales).

Future researches seem to be relevant if they could widen our research sample, considering the effect of other factors such as investment in information technology and communications, the integration of external logistics, management accounting and control systems and new products development etc.

Since strategic relationships intangible capital in a supply chain is seen as a process of creating a competitive advantage, adding value and improving financial performance, the direct and indirect effect of these contingency factors, by improving the features of SBSR intangible capital, on the company financial performance should be investigated.

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