2013 International Conference of the Association Global Management Studies (ICAGMS)

Theme: Globalization, Innovation and Management Scholarship

Title: ***The influence of inter-firm relationships on Supply Chain Quality Management: A Survey of UK firms***

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Abstract:

Claims of the association between ***inter-firm relationships*** *and the successful implementation of* ***Supply Chain Quality Management (SCQM)*** *practices have been long discussed in the literature. Nevertheless, these assumptions lack consistent empirical support. Using a quantitative survey approach of a sample of UK firms, this study offers a response to such void in the existing research and makes an attempt to empirically assess the impact of* ***inter-firm relationships on SCQM*** *practices.*

Findings show significant results for the association between the inter-firm relationships and SCQM. The findings present the practicing manager with two important recommendations: a need (i) to reconsider their supplier relationship management systems and (ii) to revisit their role in the implementation of quality systems across the entire supply chain networks. This study also offers the operations and supply chain management scholars an opportunity to re-examine the appropriateness of the theoretically-driven SCQM constructs for further empirical scrutiny.

Keywords: Inter-firm relationships, Supply Chain Quality Management.

INTRODUCTION

Since its first emergence in the 1980s, Total Quality Management (TQM) has been one of the most important issues in all business sectors. As businesses evolved towards fully globalized environments, and the concept of Supply Chain Management (SCM) gained ground, companies' responsibility over the quality of their final products and services became broader. In consequence, TQM and SCM have become increasingly crucial and gained a solid foothold in the drive towards competitiveness.

Although this globalized era has enhanced cost reduction measures and supply chain efficiency for businesses, it has also resulted in a loss of control on the part of the businesses over the supplied parts/products/services and subsequently the entire quality chain. Given that the level and type of activities outsourced is becoming so broad, the relevant issue nowadays is not the content of outsourcing, but instead the level to which it is being implemented through the agreed (both implicitly and explicitly) buyer-supplier relationship arrangements (Ford *et al.,* 2001, p.91). This in turn requires greater involvement of all parties involved in supply chain networks in terms of providing the know-how, information-sharing and technological development (Ford *et al.,* 2001, p.92).

There is therefore an obvious and on-going focus from both practitioners and academic alike on a more thorough understanding of what constitutes an efficient relationship which results in a win-win scenario for both upstream and downstream supply chain partners. Once advised to establish the least dependence on specific suppliers, companies are now encouraged to engage in higher involvement relationships (Gadde & Håkansson, 2001, p.138). In parallel, both practicing managers and academics are finally focusing on the management of supplier relationships, giving it its deserved relevance when it comes to cost reduction and overall performance leverage opportunities (Day *et al.*, 2008, p.40; Ford *et al.,* 2001, p.116; Gradinger, 2009, p.7). This is simply because (to quote Gadde & Håkansson,

2001, p.144) "...contributions from suppliers will depend on how they are handled" or managed by the buyers' (see Choi and Wu, 2009).

Accordingly, it soon became clear that solely presenting quality certifications or a final customer focused philosophy on its own was no longer enough. Companies recognize now not only the need to integrate their systems to implement the various elements of TQM, but most and foremost they recognize their interdependence on their supply chain partners to achieve the frequently acclaimed SCM and TQM benefits such as improved productivity, profitability and reduced costs (e.g., Agus, Ahmad & Muhammad, 2009).

Subsequently, following the previous 'buzzes' over TQM and SCM as separate fields of study, a new trend has emerged in the study of quality issues within the supply chain as academics shift their attention to the study of *Supply Chain Quality Management (SCQM)* in order to incorporate both fields and acknowledge their complementarity. Recent research on SCQM suggests that increased performance benefits can be obtained from this approach as an overall collaborative process (e.g., Flynn & Flynn, 2005; Foster, 2008; Kuei, Madu & Lin, 2008; Lin *et al.,* 2005; Robinson & Malhotra, 2005). However, the association between inter-firm relationships and improved SCQM practices is yet to be empirically established.

This study therefore intends to explore the associations between inter-firm relationships and the SCQM dimensions. More specifically, it offers a response to the concerns over two identified research gaps: the network relationships returns (Child & Faulkner, 1998, p.116; Ford *et al.*, 2003, p.83) and the variety of potential obtained value (Cousins, 2002, p.78). Thus, the primary aim of the current study is to provide an in-depth understanding of the impact of inter-firm relationships on the implementation of SCQM principles and the resulting outcomes for product quality.

MANAGING INTER-FIRM RELATIONSHIPS AND THE RESULTING PERFORMANCE OUTCOMES

It is not hard to understand that controlling quality throughout the whole supply chain can reveal quite a complex task. This is because the entire supply chain process involves many suppliers and several product/service combinations which can, at any stage, compromise the promise of quality made to customers'. For this reason, the importance of inter-firm relationships to the quality management's success has long been advocated (e.g. MacBeth & Ferguson, 1994, p.62; Cousins, 2002, p.74; Choi & Wu, 2009, p.9). Deming (1981–1982), Garvin (1987), Juran and Gryna (1988) (Stanley & Wisner, 2001, p.289) argue that the synergy of closer supplier relationships would generate greater benefits and enable sustainable competitive advantage.

Supplier relationships are now seen as just as valuable as customers' feedback management and input (Nalebuff & Brandenburger, 2002, p.20). According to Emmett and Crocker (2009, p.77), *supplier relationship management* (SRM) refers to "the management of the whole interface between supply and buying organizations through the whole life of the contract. The aim is to achieve maximum long-term contribution from the supplier that works towards achieving the buying organization's strategic goals." In other words, SRM requires that all the participants make the most out of the established relationships. This goes far beyond the establishment of a formal agreement or legal contract at the beginning of the outsourcing decision (Day *et al.,* 2008; Emmett & Crocker, 2009; Gradinger, 2009) and implies more than technological integration as perceived by the traditional approaches (Gradinger, 2009, p.7). SRM can therefore be interpreted as "a broad based management methodology and set of practices that describe how a firm manages its supply base" which in turn paves the way for providing "a philosophy, shared throughout an organization, that supplier relationships are important" (Trent, 2005, p.54). As a result, relationships are

interpreted as processes that need to be managed (i) to produce the desired quality outcomes (Cousins, 2002, p.78) (ii) to recognise the complexity of companies' portfolios and (iii) to realise the potential to positively or negatively impact on overall performance (Cousins & Spekman, 2003, p.21; Gradinger, 2009, p.7).

In the light of the importance attached to the effective supply chain relationships, companies develop a mix of relationships with the various nodes of their networks and each relationship will be "characterized by a mix of conflict and cooperation" (Gadde & Håkansson, 2001, p.152; Ford *et al.,* 2001, p.116). In this respect, the literature on relationship management tends to focus on the distinction between discrete/competitive transactions and relational exchanges (Schimmelpfennig, 2008, p.7). A competitive relationship refers to "a buying–selling agreement where participants conduct business for a specific time period according to terms generally outlined in a standard contract". Relational exchanges refer to "a long-term relationship where participants generally cooperate, share information, and work together to plan and even modify their business practices to improve joint performance" (Whipple, Lynch & Nyaga, 2010, p.507).

In practice, instead of pure forms of discrete or relational relationships, companies develop different relationships with different nodes of the network (Bensaou, 1999) which can be positioned within a 'continuum' of varied involvement levels (Dwyer *et al.,* 1987, p.14; Robicheaux and Coleman, 1994, p.39; cited by Schimmelpfennig, 2008, p.7). In the current study the operationalization of the inter-firm construct is regarded as a combination of items from both ends of the continuum.

As a result, several authors argue that added value can be obtained through the strengthening of mutually beneficial relationships that stimulate the development of trust, further commitment and stronger ties which make long-term relationships a profitable alternative (Boonstra & Vries, 2008; Cousins, 2002; Day *et al.,* 2008; Emmett & Crocker,

2006, 2009; Ford *et al.*, 2003; Gadde & Håkansson, 2001; Gradinger, 2009; Kwon, 2008; McClellan, 2003; Nyaga, Whipple & Lynch, 2010; Schimmelpfennig, 2008). This long-term view on the relationship portfolio management requires the involvement of the whole organisation in the "proactive design" (Gradinger, 2009, p.7) of all supply relations in order to achieve both operational and strategic/competitive benefits (Webb, 2007, p.7; Trent, 2005). This leads us then to the need to study the overall organisational network, which in this study is being portrayed by the supply chain quality management concept.

SUPPLY CHAIN QUALITY MANAGEMENT

Several authors have suggested separate TQM and SCM elements and their effects as separate entities have been for long a focus of intense debate and research. As a result, a common core of principles can be identified which include dimensions such as top management commitment/strategic planning, customer focus (customer-supplier chain), supplier management, employee involvement and continuous improvement/learning (cf. Figure 1). In addition, these dimensions also implicitly include the long-term relationship elements previously mentioned such as information sharing, establishment of long-term and trusting relationships with suppliers, internal integration, mutual dependence and commitment (Theodorakioglou, Gotzamani & Tsiolvas, 2006, p.148).

Accordingly, Kuei, Madu and Lin (2008, p.1132) put forward the fundamental *supply chain quality management* (SCQM) conditions embracing all these elements into five summarized dimensions which include *customer focus*, *quality of the IT system*, *supplier relationships*, *externally focused process integration* and *supply chain quality leadership*. Hence, measuring SCQM for the purpose of this study implies the use of a scale that incorporates each of these five dimensions.

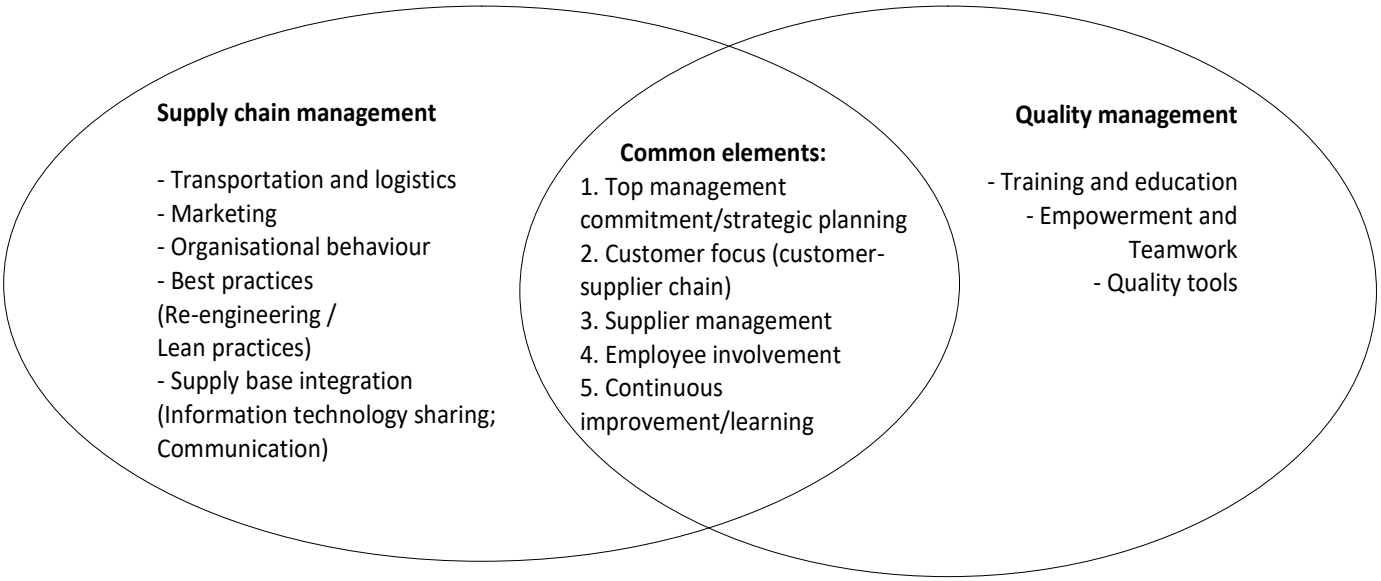

Figure 1: *The interface between SCM and QM*
(adapted from: Soltani et al., 2011, p.273; Talib, Rahman & Qureshi, 2011, pp.271-272).

Customer focus refers to the relationships developed with downstream elements of the supply chain in order to ensure that customer satisfaction levels are met through the feedback of product/service information. In turn, the *quality of the IT system* refers to the type of information sharing exchanged within the supply chain regarding quality and to the systems and mechanisms in place to facilitate this exchange. As previously explained, *supplier relationships* refer to the relationships developed with upstream supply chain members and they include the selection of these suppliers, their evaluation once they are part of the supply chain and the level to which companies are involved in quality activities with these suppliers (commonly referred to as participation and training). In what concerns the *externally focused process integration,* this refers to the activities performed outside the focal firm in order to guarantee supply chain integration. Finally, *supply chain quality leadership* refers to the level of top management involvement or leadership in what regards quality management practices.

Firstly mentioned by Ross (1998; cited by Sila, Ebrahimpour & Birkholz, 2006, p.492), SCQM was suggested as "the latest stage in the total quality movement" and defined as "the participation of all members of a supply channel network in the continuous and

synchronized improvement of all processes, products, services, and work cultures focused on generating sources of productivity and competitive differentiation through the active promotion of market winning product and service solutions that provide total customer value and satisfaction". It refers to the dissemination of quality practices throughout the supply chain (Robinson & Malhotra, 2005, p.315). Since products, information and processes pass from one chain member to the other, their quality is affected by all of the involved in the SC (Sila, Ebrahimpour & Birkholz, 2006, p.492), thus SCQM refers to the "systems-based approach to performance improvement that leverages opportunities created by upstream and downstream linkages with suppliers and customers" (Foster, 2008, p.461).

As researchers attention move from the traditional organization-centred towards network systems approaches (Kuei *et al.*, 2001; Robinson & Malhotra, 2005), academics and managers are no longer concerned with their individual performances but with the competitive advantage that their network linkages can generate. Therefore, although individually TQM and SCM have proved to be two fundamental philosophies and practices critical to organizational performance (Gunasekaran & McGaughey, 2003; Robinson & Malhotra, 2005; Casadesus & Castro, 2005; cited by Vanichchinchai & Igel, 2009, p.250), it is now of interest to understand the benefits of a joint approach to these practices.

Consequently, it is expected that inter-firm relationships lead to mutual cost reductions, enhanced organisational performance (Christopher, 2005; Fynes, Burca & Voss, 2005; Gattorna, 2009; Lambert, 2008; Narasimhan & Mahapatra, 2004) and positively influence supply chain performance (measured by variables like quality, delivery, cost and flexibility) (Fynes *et al.,* 2005). Thus, the relationships developed within the network will ultimately influence the translation of SCQM practices into performance outcomes. Hence, it is expected that:

H1: Inter-firm relationships positively influence SCQM practices.

Following Kuei, Madu and Lin's (2008, p.1132) SCQM critical success factors (as explained above), it is therefore expected that inter-firm relationships also positively influence each of these SCQM dimensions. Some of these dimensions were further operationalized and relabelled for the purpose of data collection to facilitate their interpretation. Thus the following dimensions were considered for the subsequent analysis: *customer focus, information sharing with customers and suppliers, supplier relationships, supply chain activities and leadership*.

Following this, H1 can then be subdivided into the different SCQM dimensions. Associations are therefore expected between all of these dimensions as depicted by hypotheses H1a) to H1f) as follows:

- *H1.a) Inter-firm relationships positively influence Customer Focus practices.*
- *H1.b) Inter-firm relationships positively influence Information sharing practices with customers.*
- *H1.c) Inter-firm relationships positively influence Information sharing practices with suppliers.*
- *H1.d) Inter-firm relationships positively influence Supplier Focus practices.*
- *H1.e) Inter-firm relationships positively influence Supply Chain Activities practices.*
- *H1.f) Inter-firm relationships positively influence Leadership/top management involvement practices.*

METHODOLOGY

As previously mentioned, the main focus of this study is to understand the influence of inter-firm-relationships on the implementation of quality practices throughout the supply chain. To achieve this, two main constructs need to be operationally defined and measured: SCQM and Inter-firm Relationships. Since they cannot be directly measured, scales based on previous studies were developed (cf. Table I).

Table I: *Operationalizing constructs (Adapted from: Bryman & Cramer, 2009, p.75).*

CONSTRUCTS	DIMENSIONS	SOURCES
Supply Chain Quality Management (SCQM)	Customer Focus	Tan, *et al.*, 1999, p.1041
	Information Sharing	Kannan & Tan, 2010, p.215
	Supplier Focus	Carr & Pearson, 1999, p.508 Kannan & Tan, 2010, pp.211/215 Zhang, Waszink & Wijngaard, 2000, p.752
	Supply chain activities	Kannan & Tan, 2010, p.211
	Leadership	Zhang, Waszink & Wijngaard, 2000, p.752
Inter-firm relationships		Slater & Narver, 1994 (cited by Fynes, Búrca & Voss, 2005, pp.3314-3315) Wu, Choi & Rungtusanatham, 2010, p.122 Heide & John 1992 (cited by Fynes, Búrca & Voss, 2005, pp.3314-3315) Lambert, Knemeyer & Gardner, 2010, p.6

Multi-item 7-point Likert scales were used to avoid sensitivity issues (Warner, 2013, p.903). Plus, according to Warner (2013, p.915), multiple-item scales offer greater advantages than single-item scales not only in terms of sensitivity to individual differences but also since they are generally more reliable (allowing the assessment of internal consistency reliability), have greater variance and the scores formed by summing multiple measures tend to resemble a somewhat flattened normal distribution. Following the

elaboration of the scales to measure the three different constructs, the survey was then pre-tested in a two stage process.

Firstly there was the need to access if the contents were clear, easily understood and if the layout facilitated completion. This survey was then initially pre-tested to ensure face validity, that is, to ensure that the items considered did seem to measure the concepts they were supposed to measure (Sekaran & Bougie, 2009, p.159). The obtained comments revealed that main concerns referred to the length of the survey and the use of technical terms in certain questions and categories. Alterations included the shortening of the survey by removing some items and re-formulation of some questions/items to facilitate understanding. Some layout issues were also resolved.

On the second stage of the pre-test, once ambiguity and layout issues were resolved, the link to the modified survey draft was then distributed online through snowball sampling which included managers/directors from different industries. This online survey was started by 76 participants but only 30 submitted completed surveys during a 3 month period (which included summer holidays and delayed replies).

DATA ANALYSIS AND FINDINGS

The results here presented discuss the findings of the second pilot study conducted as part of a larger doctoral research project. Although unable to generalize these results due to the small sample size (N=30), conclusions can still be drawn which allow us to discuss the scales suggested for each of the constructs considered and the theorized influence of inter-firm relationships on SCQM.

From the 30 surveys considered for the analysis, 50% of the respondents were quality related managers or directors and 40% were general managers or directors whilst the

remaining participants had other job titles but were equally relevant decision makers for the sample purpose. When considering the type of industry of each of the companies of these respondents it can be seen that 47% were manufacturing companies and 53% service industry companies. Plus, 34% were large companies (> 251 employees) and 63% small companies (< 251 employees). When it comes to number of main suppliers, the sample shows that 60% have less than 20 main suppliers and 40% show more than 20 main suppliers. Plus, 33% of the companies considered exist for less than 20 years and 67% have been created more than 20 years ago.

Following this, the influence of these company's background variables (Industry type, Workforce size, Number of Main Suppliers, Company Age, Who is in charge of QM practices?) on SCQM and inter-firm relationships was also tested. These independent variables were transformed into binary (2 categories: 1 and 2) variables to facilitate the analysis. By comparing for differences between the 2 groups for each variable through t-tests (N=30), no statistically significant differences were found for each of the two main constructs (SCQM and inter-firm relationships) when it comes to company age (<20 years or ≥20 years), number of main suppliers (<20 main suppliers, ≥20 main suppliers), industry type (manufacturing or services), quality responsibility (quality managers or general/other managers) and workforce size (large or small companies).

Regarding the treatment of the scales, standard procedures were used to assess the validity and reliability of the constructs. Through the use of Cronbach's alpha, the analysis of internal consistency showed high component reliability ($\alpha > 0.7$) for each of the considered scales. This means that the different items considered can be said to express the same concept (Vaus, 2002, p.19) for the total score based on a sum of items (Warner, 2013, p.919). These results suggest that all measures exhibit satisfactory validity and can be meaningfully used for hypotheses testing.

The multi-item scales were analysed using factor analysis, a data reducing technique that allows researchers to group the measured variables into a smaller number of factors, that is, the underlying constructs or latent variables/dimensions which constitute in this case SCQM and inter-firm relationships (Warner, 2013, p.829). Each of the factor analysis results is provided in the tables II-III below. Following Kaiser's criterion, factors with an eigenvalue of less than 1 were excluded (Gray & Kinnear, 2012, p.614). Plus, variables with low communality and component loadings were also removed (Pestana & Gageiro, 2003, p.506) following the underlying literature review (Pestana & Gageiro, 2003, p.516).

Table II: *A summary of the SCQM factor analysis: 5 separate dimensions.*

Dimensions:	Number of items removed	Total number of items kept	KMO	Total variance explained
Customer focus	3	4	0.683	54.898%
Information sharing	2	7	0.6	44.8%
Supplier focus	4	8	0.67	51.78%
Supply Chain activities	No items removed	7	0.788	56.4%
Leadership	No items removed	6	0.869	69.81%

Table III: *Inter-firm relationships factor analysis.*

Construct:	Number of items removed	Total number of items kept	KMO	Total variance explained
Inter-firm relationships	1	15	0.708	51.3%

The SCQM factor scores obtained (customer focus, information sharing/customers, information sharing/suppliers, supplier focus, supply chain activities and leadership) (cf. table II) show KMO values ≥ 0.6 which is a reasonable KMO value and explained variances >40%.

In turn, the factor score obtained for inter-firm relationships (cf. table III) from the factor analysis shows a KMO of 0.708 and explains 51.3% of the variance. Each of these factors was then used as representative variables for input into subsequent analyses to test the hypotheses (Gray & Kinnear, 2012, p.603).

Afterwards, a correlation analysis was performed with all the factors. The correlation measures the strength of association between them. *Pearson r* was chosen because it is independent both from the scale of measure (both X and Y are standardized) and from the sample size (N-1) (Tabachnick & Fidell, 1996, p.54). Significant correlations at the 0.01(**) level (2-tailed) and at the 0.05(*) level (2-tailed) could be found with values around 0.4, which consists in a reasonable score.

Following this, hypotheses were tested by performing regression analyses for each of the dimensions previously defined. The linear regression equation is $\mathbf{Y=\alpha + \beta X}$, where $\boldsymbol{X}$ is the explanatory variable and $\boldsymbol{Y}$ is the dependent variable. The slope of the line is $\boldsymbol{\beta}$, and $\boldsymbol{\alpha}$ is the intercept (the value of $\boldsymbol{y}$ when $\boldsymbol{x} = 0$) (Warner, 2013, p.344). Hence, six regression analysis were conducted where Y = inter-firm relationships and X = each of the SCQM dimensions one at a time. The SCQM dimensions were considered separately which allowed H1 testing as summarized by table IV. The results for H1a) to H1f) are explored in detail in the following sections. These results allow us to partially support H1 given the rejection of H1a).

Table IV: *Hypotheses testing: results summary.*

Hypotheses:	**Results:**
H1: Inter-firm relationships positively influence SCQM practices.	Partially supported
H1.a) inter-firm relationships positively influence Customer Focus practices.	Rejected.
H1.b) inter-firm relationships positively influence Information sharing practices with customers.	Accepted.
H1.c) inter-firm relationships positively influence Information sharing practices with suppliers.	Accepted.

H1.d) inter-firm relationships positively influence Supplier Focus practices.	Accepted.
H1.e) inter-firm relationships positively influence Supply Chain Activities practices.	Accepted.
H1.f) inter-firm relationships positively influence Leadership/top management involvement practices.	Accepted.

H1.a) inter-firm relationships positively influence customer focus practices.

The regression analysis for H1a) shows no significant results with t (28) = 1.763, p=.089. Hence inter-firm relationships cannot be taken as a useful predictor of customer focus practices. Nevertheless, it is fair to say that this result might become significant once the sample size increases.

H1.b) inter-firm relationships positively influence information sharing practices with customers.

In turn, H1b) is supported so inter-firm relationships seem to be a good predictor of information sharing with customers with F (1, 28) = 7.963, p = 0.009, but explaining only 22%. The regression equation (cf. Table V) can then be defined as *CUSTOMERS INFORMATION SHARING = 1.789E-016 + 0.471 INTER-FIRM RELATIONSHIPS*.

Table V: *Coefficients for the regression equation for "Information sharing with customers".*

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.789E-016	.164		.000	1.000
Inter-firm relationships	.471	.167	.471	2.822	.009

H1.c) inter-firm relationships positively influence information sharing practices with suppliers.

As hypothesized, inter-firm relationships are also found to be a good predictor of information sharing with suppliers with F (1, 28) = 5.394, p = 0.028, but explaining only 16% of the results. The coefficients (cf. table VI) for the regression equation determine the equation as follows: *SUPPLIER INFORMATION SHARING = 4.968E-017 + 0.402 INTER-FIRM RELATIONSHIPS*.

Table VI: *Coefficients for the regression equation for "Information sharing with suppliers".*

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.968E-017	.170		.000	1.000
Inter-firm relationships	.402	.173	.402	2.322	.028

H1.d) inter-firm relationships positively influence Supplier Focus practices.

Regarding supplier focus, evidence also supports H1d). Results show that inter-firm relationships seem to be a good predictor of supplier focus practices, explaining 39% of the results with F (1, 28) = 18.230, p = 0.000. Therefore it can be defined as: *SUPPLIER FOCUS 1 = 1.086E-016 + 0.628 INTER-FIRM RELATIONSHIPS* (cf. table VII for coefficients).

Table VII: *Coefficients for the regression equation for "Supplier focus 1: evaluation and participation".*

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-6.857E-017	.083		.000	1.000
Inter-firm relationships	.368	.084	.638	4.383	.000

H1.e) inter-firm relationships positively influence Supply Chain Activities practices.

In what concerns, H1e), the analysis show that 48.6% of *Supply Chain Activities* (SCA) are explained by inter-firm relationships, F (1, 28) =26.520, p = 0.000, which allow us to establish the equation as: *SCA = -6.878E-017 + 0.697 INTER-FIRM RELATIONSHIPS* (cf. table VIII).

Table VIII: *Coefficients for the regression equation for "Supply Chain Activities".*

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-6.878E-017	.133		.000	1.000
Inter-firm relationships	.697	.135	.697	5.150	.000

H1.f) inter-firm relationships positively influence leadership practices.

In turn, 16% of leadership is explained by inter-firm relationships, providing evidence to accept H1f) where F (1, 28) = 5.347, p = 0.028 with the following regression equation: *LEADERSHIP = 1.816E-017 + 0.400 INTER-FIRM RELATIONSHIPS* (cf. table IX).

Table IX: *Coefficients for the regression equation for "Leadership".*

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.816E-017	.170		.000	1.000
Inter-firm relationships	.400	.173	.400	2.312	.028

CONCLUSIONS AND IMPLICATIONS

As our review of the literature on SCQM indicates it is crucial to understand how to control quality throughout the whole supply chain. In addition, the strategic management of the inter-firm relationships is assumed to be the key for future competitiveness and superior performance.

Our results show a significant association between inter-firm relationships and SCQM. Nevertheless, H1 is only partially supported because H1a) shows no significant results. This is probably due to the sample size which if increased might reveal a significant effect. Moreover, customer focus (H1.a) refers to downstream relationships whilst inter-firm relationships refer to downstream relationships which might also explain the lack of significance. This shall be further explored in the results of the ongoing study.

Although part of an ongoing research, and therefore not able to generalize, these findings represent an important theoretical and empirical contribution in the field. This small data set allows researchers to go beyond the theoretical definitions so far discussed in the literature, answering the operationalization concerns particularly regarding SCQM and inter-firm relationships. Based on the results, which show that these are not only valid but also reliable constructs, it is argued that it is not only possible to define them theoretically but also to empirically measure the dimensions created. This is supported by the high reliability obtained for each of the scales considered. The results of the ongoing research expect to contribute then with newly created scales for these constructs which are usually only defined in the literature and lack empirical research.

Besides calling researchers to focus on further empirical studies that can support these assumptions and establish clear operational definitions for each of the constructs, these findings also seem to suggest managerial implications such as the need for managers to

dedicate further attention to the development of their supplier relationship portfolio as argued by the recent literature on supplier relationship management and SCQM. Subsequently, as the field of supplier relationship management systems grow not only theoretically but also in terms of the software tools available for companies, the findings from this study certainly strengthen these convictions and validates the investments made in such management tools. Thus, given that inter-firm relationships can be a predictor of supply chain quality, managers need to assume a more strategic and pro-active role in the creation, maintenance and control of these relationships if they are to control the effects of the introduction of globalized outsourcing. To sum up, their responsibility does not get diminished just because they outsource parts of their production/service system. On the contrary, it becomes greater as they need to ensure that the developed relationships between the elements of the chain contribute positively towards the implementation of the SCQM practices.

For future research, first and foremost one needs to consider the limitations of this study which can explain to a certain extent the non-significant effect obtained. Therefore, a larger sample size is needed to be able to make stronger assertions from the data and produce representative differences. And secondly, one must consider the need to differentiate between the different relationships that can be established between companies. Hence, for further research purposes, it is recommended that instead of only one construct for inter-firm relationships, different dimensions are considered to better characterize and distinguish the effects of each of the relationships developed within the relationship *continuum*.

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