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The Relationship between Supply Chain Management and Competitiveness in the Manufacturing SMEs of Aguascalientes

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Abstract

The globalization of the markets and the new business environmental are forcing to the organizations, mainly to the small and medium-sized enterprises, to improve their competitiveness significantly since to remain in the current market it is necessary to modify the managerial strategies to adapt them to the changes and the clients' requirements. In this sense, the supply chain management appears in the literature like one of the managerial strategies that are implementing in important number of firms to be able increase competitiveness. Therefore, the essential objective of this paper is analyzing the relationship between supply chain management and small and medium-sized enterprises competitiveness, using for it a sample of 305 firms of the Aguascalientes State. The obtained results show that supply chain management has a positive influence in competitiveness level, like in the financial performance, costs reduction and the technology use of the small and medium-sized enterprises.

Keywords: SMEs, supply chain management, competitiveness.

Resumen

La globalización de los mercados y el nuevo ambiente de los negocios están obligando a las empresas, principalmente a las pequeñas y medianas, a mejorar significativamente su competitividad ya que para permanecer en el actual mercado es necesario modificar las estrategias empresariales para adecuarlas a los cambios y requerimientos de los clientes. En este sentido, la gestión de la cadena de suministro aparece en la literatura como una de las estrategias empresariales que se han implementando por un número importante de empresas para lograr incrementar su competitividad. Por lo tanto, el objetivo esencial de este trabajo es analizar la relación existente entre la gestión de la cadena de suministro y la competitividad de las pequeñas y medianas empresas, utilizando para ello una muestra de 305 empresas del Estado de Aguascalientes. Los resultados obtenidos muestran que la gestión de la cadena de suministro tiene una influencia positiva tanto en el nivel de competitividad, como en el rendimiento financiero, la reducción de costos y el uso de tecnología de las pequeñas y medianas empresas.

Palabras Clave: *Pyme, procesos de producción, competitividad.*

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1. Introduction

The first decade of the new millennium its characterized by a global competitiveness, for vertiginous changes in the technological development and for an increment in the expectations of the clients and consumers demands, that which has caused that the organizations, mainly the small and medium-sized enterprises (SMEs), have to look for new managerial strategies to adapt it more quickly possible to the market demands (Vokurka, Zank and Lund, 2002). Therefore, the traditional pattern of a mass production has been had to restructure to adapt it to the new demands that it demands the market, and so that it provides a higher competitiveness level to the companies in a new business environmental.

Also, the companies have implemented a series of actions to improve their internal operations, like it the increment of the products and services quality, accompanied by a significant costs reduction, that which has allowed the development of higher competitive advantages of the firms in connection with their main competitors, in diverse such areas as the reception and delivery of orders, flexibility of the processes and products and services innovation. Therefore, the SMEs that have adopted and implemented a supply chain management strategy, have been successful as much in their initiatives as in the achievement of the objectives and outlined goals, that which has generated a significant increment in the competitiveness level of the organizations (Vokurka *et al.*, 2002).

In addition, the academic alliance forum (1999) it considered that the traditional firm competitiveness is changing quickly, in the measure in that every day the number of organizations is increased that are implementing the supply chain management like a managerial strategy. Ferdows and De Meyer (1990) reached the conclusion that to achieve higher competitive advantages the companies that to improve supply chain management. Vokurka and Fliedner (1998) considered that supply chain can be considered like an extension of the company, and that this should be guided in the sequence of the whole supply channel through the improvement in products and services quality, flexibility, agility and costs efficiency, generating with it a higher business competitiveness level.

On the other hand, Schueltz, Deering, Kilpatrick and Derocher (1999) considered that the supply chain can be considered as an extension of the company, in which each firm in the particular thing can be conceived as a business unit inside the supply channel. Moreover, the diverse firms that participate in the supply chain can also be understood as an extension of the business, *"since they provide a higher efficiency in the companies functions like in the*

processes through the relationships among the organizations" (Crankcase, Crankcase, Monczka, Slaight and Swan, 2000).

This way, the suppliers selection is essential for the business success since is through them like they can improve the materials flows significantly, products, information and funds that require the companies manufacturers, since these capacities are necessary and elementary for all and each one of the firms that participate in the supply chain, and they can be implemented in the entirety of the activities that are carried out in the supply chain, generating with it a higher probability of achieving better benefits as higher competitive advantages to the organizations (Vokurka *et al.*, 2002).

In this sense, the pressure of the environment from the business to the companies to constantly improve competitiveness level, can increase the emphasis that the organizations have to give to the costs effectiveness (Crankcase *et al.*, 2000), since only with an costs effectiveness it is like they can be achieved the goals more easily and can improve internal activities of the supply chain. Therefore, quality, dependence, flexibility and agility of the supply chain will be high-priority in the supply chain management besides that the supply chain management will be guided in the efficiency and costs reduction, since with will be able to improve the competitiveness level of the companies significantly (Vokurka *et al.*, 2002).

In this context, the investigation carried out in this paper presents the results of an analysis of the relationship between supply chain management and competitiveness level of the SMEs of Aguascalientes, using for it a sample of 305 companies. The rest of the study has been organized in the following way. In the second section the theoretical framework is revised, the previous empiric studies and they think about the hypotheses research. In the third section the methodology of the investigation is explained. In the quarter section the results are analyzed and, finally, in the fifth section the main conclusions and implications of this study are exposed.

2. Literature review

Presently epigraph, in the first place is carried out a revision of the literature on the supply chain management in the small and medium-sized enterprises. Subsequently it is tried to define the relationship between supply chain management and competitiveness level, and the hypotheses and proposed relationships are specified.

2.1. Supply Chain Management in the Small and Medium-Size Enterprises

The small and medium-sized enterprises (SMEs) of any part of the world, today they are facing a diversity of problems, derived of the constant changes in the market demand and the new type

of consumers that are arising in the market (Söderberg and Bengtsson, 2010). This new type of consumers has within its reach a more global offer of products and services, that which favorable that the demand is increased in terms of service, consistency in the deliveries and the costs reduction and delivery time of the products. Therefore, to be able to fulfill the requirements of the products and services demand, the SMEs has to develop their abilities and knowledge and to apply them in the organizational processes (Lockmany III and McCormack, 2004b; McCormack, Ladeira and Valderes de Oliviera, 2008), and to adopt and implement new managerial strategies and the supply chain management is the strategy that every time has more followers.

The increment of the importance of the supply chain management like a managerial strategy, it can be attributed to two essential elements: the increase of the globalization of the outsourcing and the higher emphasis in the products and services quality, associated to the high competitiveness level and business uncertainty (Mentzer, DeWitt and Keebler, 2001). Therefore, the SMEs can improve their competitive advantages require of optimizing the production activities, distribution, transport, storage and information technologies, since an efficient and effective logistics and supply chain management, especially in the emergent economies as it is the case of Mexico, it can generate as much in the SMEs as in the rest of the firms a higher competitiveness level (Thakkar, Kanda and Deshmuskh, 2009).

Hong and Jeong (2006) concluded that the efficiency and effectiveness supply chain management are a essential managerial strategy by means of which SMEs can obtain a higher competitiveness level, still when most SMEs commonly works with a reduced capital investment and are bigger their necessities of capital work. Additionally, diverse SMEs has a strong pressure of the market so that its products and services have presence in other different markets from those that moment participates, since most SMEs has marketing abilities very reduced and few available funds in general to growth and to be developed (Thakkar *et al.*, 2010).

Furthermore, the absence of a trade mark associated to a low control of the products and services, commonly generate in the SMEs high prices and the imposition of clauses of exclusive sales, since in accordance with Sastry (1999) SMEs doesn't generally have a strong market position and their expansion is very limited, and so that these are successful in the market in the one participate and more competitive advantages, require to improve significantly their innovation activities like operations and processes, mainly in the areas of inventories, time reduction of the shipping's, coordination with their suppliers and practical labor (Thakkar *et al.*, 2010).

In this sense, the literature of the supply chain management area, it is considered that a positive relationship between supply chain management and SMEs, since the adoption and implementation supply chain management activities, help to SMEs overcome the barriers that inhibit its growth and the obtaining of resources through the increment of innovation activities, the significant costs reduction, decrease of business uncertainty and the significant decrease the accidents rate (Coviello and McAuley, 1999) besides that supply chain management practices are necessary and elementary, not only so that SMEs can survive but also so that they can generate a higher performance (Thakkar *et al.*, 2010).

Finally, the literature review allows to conclude that it exists empirical evidences that relates the supply chain management and SMEs, in which have been identified diverse positive as negatives that show that the practices, so much of the logistics management as supply chain management they are essential to improve SMEs competitiveness level (Halley and Guilhon, 1997; Huin et *al.*, 2002; Quayle, 2002, 2003; Sardana, 2004; Singh, 2004; Morrissey and Pittaway, 2004, 2006; Power, 2006; Arens and Winser, 2005).

2.2. Relationship between Supply Chain Management and Competitiveness

The current literature of the managerial sciences area considers that supply chain management can increase the competitiveness level of the organizations significantly, through the integration of the business internal functions like the connection that these have with the external operations as is the case of suppliers, clients and other members that participate in the supply channel (Jiqin, Omta and Trienekens, 2007). Moreover Quinn (1997) it considered that the companies that have adopted and implemented activities to reduce their total costs, have higher probabilities of obtaining competitive advantages, since the firms need to be adapted to the changes that it demands the market in a convenient and reliable way, quickly that which can help them to reduce their costs significantly, to increase the productivity and to reduce risks can be translated as more competitive advantages for the organization (Walker, Bovet and Martha, 2000).

On the other hand, Bagchi (1996) considered that the supply chain activities have a bigger effect in the competitiveness level are the time measurement, quality, limits and diagnosis; while Ittner and Larcker (1997) considered that the supply chain practices can generate higher competitive advantages to the organizations are those that involve clients as to suppliers, non price factors in the partners selection and long term relationship that one has with the suppliers. Also, Ramdas

and Speakman (2000) concluded that the ability to gather information, products or services differentiation, product personalization and precise answers to the clients can generate a higher competitiveness level to the companies.

Hyland and Beckett (2002) considered that a high level of internal learning usually defines as much the current practices as the new practices that it can adopt the company, that which can generate a higher competitiveness level. Udomleartprasert and Jungthirapanich (2003) concluded in its investigation that the organizations can improve its competitiveness level if they implement more activities than generate additional value for the clients and suppliers, since only some how many firms are guided in more measure in those activities that generate a maximization of their earnings and a reduction of their total costs (production, operation and quality), that which can generate a significant increment in financial performance and business growth (Singh, Sandhu, Metri and Kaur, 2010).
Furthermore, Chen and Qi (2003) concluded that the tendency exists in the economy globalization and technologies management, long term it generates a higher competitiveness level in the organizations, since firms can improve its competitive advantages by the clients and consumers satisfaction, to respond quickly to the market demands, to improve the coordination and cooperation in information sharing, sales increment, costs reduction and the adoption of new administration philosophies like it is the case of Just-on-Time (JIT) and adjusted production.

This way, in the last two decades the knowledge management in the supply chain has become one of the most important topics, as much for the researchers as for the academics and professionals of the logistics and supply chain management field, and this management commonly help to the companies to increase its competitiveness level (Sour, Muddy and Gallant, 2006), since the ability that organizations possess to share and to integrate the knowledge generated along the supply chain is considered in the current literature like an element of success and competitiveness (Singh *et al.*, 2010).

In this sense, Kim (2006) concluded that efficient supply chain integration can generate a sustainable improvement in performance and competitiveness, so much of long companies as small and medium-sized enterprises. Also, the integration that SMEs carries out will be implemented in the practices and competitive capacities of the supply chain management, so that better results are obtained. In addition, Selldin and Olhager (2007) considered that quality, speed in the deliveries, dependability in the deliveries, costs, flexibility in the volumes, flexibility in the mix of products and profitability generate an impact in competitiveness level of the organizations.

In the same way, Kenneth, Whitten and Inman (2008) concluded that logistics activities has a significant positive impact in supply chain management strategy, and that so much logistics activities as supply chain management strategy has a significant positive impact in marketing activities, the one which in turn he has a significant positive impact in financial performance, but only the supply chain management strategy allowed to obtain a significant positive impact in financial performance, what can generate a higher competitiveness level in the organization.

Ferry, Kevin and Rodney (2007) proposed that the price, quality, response time to the market and sales growth is the components most important of supply chain management that affect the competitiveness level of the companies directly; while Chow, Christin, Chu-Hua, Min, Chinho and Hojung (2008) concluded that the service quality, distribution operations and effectiveness in products design that the enterprises offer in the market, is the essential components of supply chain management that generate bigger competitive advantages in the business.

On the other hand, Othman, Sungkard and Hussain (2009) considered that an efficient one and information sharing among the companies that participate in the supply channel, are the elementary activities of the supply chain management that generate a higher competitiveness level in the companies. Also, Shankar *et al.* (2009) identified that the retailers SMEs very time are disappearing of the market because of the high competitiveness level, so much in internal market as in international market, in those which the changes that the clients demand and final consumers are more and more constant.

As a result of these changes, every time they are more SMEs that are looking for new managerial strategies that allow them to integrate their resources and capacities with those of their clients and suppliers, that which can allow SMEs generates higher value and long term more competitive advantages. Therefore, in a next future the SMEs has to be guided in three big tendencies that it demands the market: better international resources practices, better channels to make arrive the products and services to the market and a better relationship with the clients and suppliers based on more innovation activities, since it can allow it the SMEs to obtain a higher competitiveness level (Singh *et al.*, 2010).

Based on the previously presented information, at this time it can think about the following hypothesis:

H1: The higher supply chain management level, the higher competitiveness level in SMEs.

3. Methodology

To validate the hypotheses proposed in this study it was carried out an empiric investigation in the manufacturing SMEs of the Aguascalientes State (Mexico), in short the analyzed environment is the existent relationship between supply chain management and the small and medium-sized enterprises competitiveness level. The procedure that was used to obtain the reference mark, consisted on the obtaining the Managerial Directory 2010 of the Managerial Information System of Mexico (Sistema de Información Empresarial de México) of Aguascalientes State (6,361 companies). For effects of this paper, they were only considered those companies that had registered between 5 and 250 employees (MiPymes), with that which the definitive managerial directory was with a total of 1,122 companies. The original sample is 333 firms and this was selected by means of a simple random sampling with a maximum error of ±4.5 per cent and a level of dependability of 95 per cent.

In a same way, the survey was designed so that it was answered by the SMEs managers and it was applied by means of a personal interview to each one of the 333 companies selected during the months of January to April of 2012, of which 315 were received, and 10 were eliminated by not gathering with the established requirements, being a total of 305 validated surveys. This way, a rate of answer of 92 per cent has been had. The survey gathered the information on the firm characteristics, supply chain management activities and SMEs competitiveness level. The Table 1 summarizes the most outstanding aspects of the investigation.

Table 1. Technical Issue of the Investigation

Characteristic	It interviews
Universe	1,122 Small and Medium-sized Enterprises
Environment Study	Aguascalientes State
Unit Sample	Manufacturing Firms of 5 to 250 employees
Method of information collection	Personal interviews
Procedure of Sampling	Random simple
Size of the Sample	333 companies
Margin of sampling error	±4.5% at a global level, for a trust level of 95% (p=q=0.5)
Dates of the field work	January to April of 2012

Source: Own elaboration with data of the SIEM 2010

3.1. Development of Measures

For the measurement of the supply chain management were considered 20 items adapted of Wisner (2003), and all these items were measured by a 5 points Likert scale, ranging from a

limits 1 = low importance to 5 = high importance. Moreover, for the measurement of the SMEs competitiveness level they took into account the three factors proposed by Buckley *et al.* (1988): *1) financial performance*, measured by a scale of 6 items; *2) costs reduction*, measured with a scale of 6 items; and *3) technology use*, measured through a scale of 6 items. All the items of the three factors were measured by a 5 points Likert scale with 1 = strongly disagree to 5 = strongly agree as limits.

3.2. Reliability and Validity

For this investigation paper and like a form to evaluating the reliability and validity of the measure scales used in the theoretical model, was carried out a confirmatory factor analysis, using the maximum likelihood method in the software EQS 6.1 (Bentler, 2005; Brown, 2006; Byrne, 2006). Also, the reliability of the scales of measure proposals was analyzed starting from the coefficients Cronbach alpha and Composite Reliability Index (CRI) (Bagozzi & Yi, 1988). All the values of the scale fulfilled the recommended level of 0.7 for the Cronbach alpha and the CRI that it provides an evidence of reliability, and it justifies the internal reliability of the measure scales used (Nunally & Bernstein, 1994; Hair *et al.*, 1995).

The adjustments that were used in this study were the Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), Comparative Fit Index (CFI) and Root Mean-Square Error of Approximation (RMSEA) (Bentler & Bonnet, 1980; Byrne, 1989; Bentler, 1990; Hair *et al.*, 1995; Chau, 1997; Heck, 1998). Values of the NFI, NNFI and CFI between 0.80 and 0.89 represent a reasonable adjustment (Segars & Grover, 1993) and a same value or superior at 0.90 are a good evidence of a good adjustment (Jöreskog & Sörbom, 1986; Byrne, 1989; Papke-Shields *et al.*, 2002). Also, other estimate methods were used when it is assumed that the normality is present, for the proposals of analysis of Chou, Bentler and Satorra followed it (1991) and those of Hu, Bentler and Kano (1992) for the correction of the statistical ones of the used estimate pattern. This way, the robust statistical will be used to provide a better evidence and a better statistical adjustment of data used (Satorra & Bentler, 1988).

In Table 2 the obtained results of the application of the confirmatory factor analysis are shown, and it is specified that all the values of the Cronbach Alpha and the CRI overcame the recommended level of 0.7, that which indicates an evidence of reliability of the scales used (Nunnally & Bernstein, 1994; Hair *et al.*, 1995), and also suggests that the theoretical model of the relationship between supply chain management and competitiveness level offers a good data statistical adjustment ($S\text{-}BX^2$ = 1,568.507; df = 623; p = 0.000; NFI = 0.797; NNFI = 0.857; CFI = 0.866; RMSEA = 0.071), all the items of the related factors are significant ($p < 0.001$), the size of all the factorial loads is superior at 0.6 (Bagozzi & Yi, 1988) and the Variance Extracted

Index (VEI) of each couple of related constructs its superior at 0.5 as it recommends it Fornell and Larcker (1981).

Table 2: Internal consistency and convergent validity of the theoretical model

Variable	Indicator	Factor Loadings	Robust t-Value	Cronbach Alpha	CRI	VEI
Financial Performance	FP1	0.799***	1.000[a]	0.916	0.896	0.661
	FP2	0.858***	17.043			
	FP3	0.909***	18.054			
	FP4	0.865***	16.023			
	FP5	0.757***	12.837			
	FP6	0.662***	11.587			
Costs Reduction	PC1	0.848***	1.000[a]	0.89	0.891	0.623
	PC2	0.871***	23.172			
	PC3	0.723***	13.834			
	PC4	0.787***	16.551			
	PC5	0.702***	13.87			
Technology Use	TE1	0.801***	1.000[a]	0.922	0.9226	0.665
	TE2	0.850***	20.382			
	TE3	0.846***	18.442			
	TE4	0.778***	18.841			
	TE5	0.783***	18.372			
	TE6	0.831***	21.272			
Supply Chain Management	CS1	0.621***	1.000[a]	0.953	0.954	0.509
	CS2	0.661***	9.919			
	CS3	0.648***	10.079			
	CS4	0.707***	9.394			
	CS5	0.686***	10.083			
	CS6	0.644***	9.225			
	CS7	0.621***	8.944			
	CS8	0.695***	9.636			
	CS9	0.780***	10.922			
	CS10	0.749***	10.002			
	CS11	0.736***	11.054			
	CS12	0.618***	9.500			
	CS13	0.742***	11.223			
	CS14	0.739***	10.614			
	CS15	0.793***	11.389			
	CS16	0.726***	11.656			
	CS17	0.793***	11.229			
	CS18	0.678***	9.730			
	CS19	0.822***	12.032			

	CS20	0.753***	11.184			
$S\text{-}BX^2$ (df = 623) = 1,568.507; p < 0.000; NFI = 0.797; NNFI = 0.857; IFC = 0.866; RMSEA = 0.071						

a = Value parameters in the identification process

* * * = p < 0.001

Source: Own Elaboration

In the Table 3 the discriminant validity is shown through two tests. First, with an interval of 95% of dependability, none of the individual elements of the factors contains the value 1.0 (Anderson & Gerbing, 1988). Second, the variance extracted among each couple of constructs of the model is superior that it's corresponding VEI (Fornell & Larcker, 1981). Therefore, we can conclude that this investigation paper shows enough it evidences of reliability and convergent and discriminant validity.

Table 3: Discriminant validity of the measurement of the theoretical model

Variables	Financial Performance	Costs Reductions	Technology Use	Supply Chain Management
Financial Performance	**0.661**	0.109	0.027	0.019
Costs Reduction	0.234 - 0.426	**0.623**	0.034	0.022
Technology Use	0.063 - 0.263	0.084 - 0.284	**0.665**	0.088
Supply Chain management	0.082 - 0.194	0.093 - 0.205	0.214 - 0.378	**0.509**

Diagonal represent the variance extracted index, while above the diagonal the shared variance (squared correlations) are represented. Below under the diagonal the 95% confidence interval for the estimated factors correlations is provided.

Source: own Elaboration

4. Results

Presently investigation paper one carries out a Structural Equations Model (SEM) to analyze the structure of the theoretical model, and to contrast the outlined hypothesis relating on one hand supply chain management with SMEs competitiveness level, and other hand, the financial performance, purchasing costs reduction and technology use as measures of the SMEs competitiveness level. The nomological validity of the theoretical model was analyzed by the

Chi-square performance, in which the theoretical model was compared with the measurement model not finding significant differences (Anderson & Gerbing, 1988; Hatcher, 1994). The Table 4 shows the obtained results of the SEM application.

Table 4: Results of the SEM of the theoretical model

Hypothesis	Structural relationship	Standardized coefficient	Robust t-Value
H1: Higher supply chain management level, higher competitiveness level.	SCM → Competitiveness	0.201***	10.412
H2: Financial performance is a good measurement of the competitiveness level.	Financial P. → Competitiveness	0.335***	15.109
H3: Costs reduction is a good measurement of the competitiveness level.	Costs R. → Competitiveness	0.328***	16.857
H4: Technology use is a good measurement of the competitiveness level.	Technology → Competitiveness	0.387***	19.458
$S\text{-}BX^2$ (df = 617) = 1,553.401; p < 0.000; NFI = 0.799; NNFI = 0.857; CFI = 0.867; RMSEA = 0.071			

* * * = p < 0.001

Source: own Elaboration

The obtained results are presented in Table 4, and for the first outlined hypothesis **H1** the results (β = 0.201 p < 0.001), indicate that the supply chain management has significant positive effects in the SMEs competitiveness level. The second hypothesis **H2** the obtained results (β = 0.335, p < 0.001), indicate that the financial performance is a good indicator of the competitiveness level. For the third of the outlined hypotheses **H3**, the obtained results (β = 0.328, p < 0.001), indicate that the costs reduction is a good indicator of the competitiveness level. Finally, the fourth hypotheses **H4** outlined, the obtained results (β = 0.387, p < 0.001), indicate that the technology use is a good indicator of the SMEs competitiveness level.

In summary, the obtained results of the application of the structural equations model show that, on one hand, the supply chain management has significant positive effects in the SMEs manufacturing competitiveness level of the Aguascalientes State and, for the other side, financial performance, purchasing costs reduction and technology use are good indicators to measure the competitiveness level.

5. Conclusions and discussion

Actually, the supply chain management has become one of the managerial strategies that more and more companies are adopting and implementing, to obtain higher competitive advantages or to improve its competitiveness level, since for the organizations in general but especially for the small and medium-sized enterprises, it is important that it completes in time and it forms with the delivery of the supplies of raw materials, otherwise the manufacturing SMEs can be seen seriously affected if their orders are not given by the suppliers in the quantities and in the specified time, because the production can have important delays and it would not be fulfilled the commitments to the clients, with that which the supply chain would be gravely perturbed in the whole process.

In this sense, the activities that the suppliers carry out is fundamental so that the supply chain management doesn't suffer any long term setback, since it is not very common that the companies are constantly changing of suppliers, for that the orders execution in the quantities and in the places required by the manufacturing SMEs it is essential, so that these in turn can give their clients the products and services requested. Therefore, if the orders are carried out exactly on time on the part of the suppliers and with the required quality, the following processes will be carried out without setback with that which the supply chain management will be more efficient, and the supply channel will have a bigger fluency and it can generate a higher competitiveness level.

Also, it is important to consider that the relationship client-supplier in the supply chain should generate trust, since it is not possible to think that a high level of insecurity exists in the deliveries of the inputs on the part of the suppliers, and of a high level of distrust in the deliveries of orders of the manufacturing SMEs to the clients. Therefore, the participant companies in the supply chain will have a better communication and to information share that is generated in the supply channel, otherwise the problems that are been able to generated derived of high level of distrust among the participant firms, it can affect the operation and acting of the supply chain management seriously, and this in turn can diminish the competitive advantages of the manufacturing SMEs.

In a same way, it is also essential that the manufacturing SMEs implements a higher level of collaboration with their clients and suppliers, with the purpose of so much efficient the information exchange like the supply chain management, since it can generate it a long term strong relationship and mutual benefits in the relationship client-supplier. Therefore, the

agreements that are generated in this relationship will be respected entirely so that the activities that are carried out in collaboration don't have problems of dependability, for it is important the application of a feedback strategy among the participant companies, since the activities of collaboration involve all the actors of the supply chain besides that represent a security so much in the handling of the materials as in the deliveries just in time, so that the suppliers don't experience delays neither important delays in the supply of the inputs of the SMEs, with that which one can obtain a higher competitiveness Level.

In the same way, it is important to consider that for any decision in the improvements of the supply chain management who should be involved also besides the clients and suppliers are the middlemen who have an important participation in the efficiency of the supply chain management. Therefore, the efforts that should show in the supply work should involve the supplier's responsibility the one which, besides having an excellent supply capacity; it should be reliable in the communication and in the improvements that are given in the feedback to any abnormality that is generated in the administration of the supplies deliveries. For the case of the middlemen, they are who they have a bigger knowledge of the problems that are generated unaware to a planning and they are in fact them who the responsible ones of managing the chain of supply of the organizations should listen so that they are eliminated to the maximum the problems.

On the other hand, it is important to recognize that this investigation paper has a series of limitations that is necessary to expose. A first limitation is the use of the scales to measure the supply chain management and competitiveness level, because in the case of supply chain management it was considered only a part of the supply channel, while the SMEs competitiveness level was measured through three dimensions, reason why in study futures it will be necessary that other dimensions and different items are used, so much in the supply chain management like in competitiveness level to check the results.

A second limitation of this study is the obtaining of the information, because considers only a part of the information of the supply chain management activities that SMEs carries out, and of the competitiveness level (financial performance, purchasing costs reduction and technology use), with that which will be indispensable to incorporate quantitative variables or data in future studies hard of the manufacturing SMEs to determine if the same results are obtained. Also, it is important to point out that a considerable number of interviewed companies considered that information was requesting was highly confidential and private, reason why the data provided by the SMEs not necessarily reflect the reality that at the moment live with regard to the analyzed variables.

A third limitation is the one that refers to the measurement of the variables used so much in the scale of the supply chain management like in the competitiveness level, because for the first scale only twenty items were used (measured in a scale type Likert of five points). For the case of the second scale they were only used six items for each one of the three dimensions (measured in a scale type Likert of five points for the financial performance, costs reduction and the technology use), reason why in future studies it will be primordial to increase the number of items and to use a scale type Likert of more punts to check the results.

A fourth limitation is that the surveys were only applied the managers and/or proprietors of the manufacturing SMEs, with that which obtained results can be diametrically different if they are used in a future a different population, reason why in future studies it would be advisable to ask the clients and suppliers of all the SMEs its opinion to check the results. A last limitation is that it stops effects of this study they were only considered the manufacturing SMEs of had registered between 5 and 250 Employees, reason why in future studies it would be advisable to consider SMEs of less than 5 employees, since this type of companies represents more than 50% of the total of the companies seated in Aguascalientes State, to check if the same results are hard.

Lastly, is it considered extremely important to analyze beyond the results obtained in this investigation paper and to discuss with more depth what an affects would have the supply chain management in the competitiveness level if a scale is used with quantitative data? How results would be obtained in manufacturing SMEs of Aguascalientes State if a different scale is used to measure the supply chain management? What do specific activities of the supply chain management that manufacturing SMEs implements have a higher impact in the competitiveness level? These and other questions that can arise of the detailed analysis in the present study can be answered in future studies.

REFERENCES

Academic Alliance Forum (1999). Future competition: supply chain vs. supply chain. *Logistics Management & Distribution Report*, 38(3), 20-21.

Acedo, F., Barroso, C. and Galan, J. (2006). The resource-based Theory: dissemination and main trends. *Strategic Management Journal*, 27, 621-636.

Anderson, J. and Gerbing, D. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychological Bulletin*, 13, 411-423.

Arend, R.J. and Winser, J.D. (2005). Small business and supply chain management: is there a fit?. *Journal of Business Venturing*, 20, 403-436.

Bagchi, P.K. (1997). Logistics benchmarking as a competitive strategy: some insights. *Logistics Information Management*, 10(1), 28-39.

Bagozzi, R. and Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74-94.

Bentler, P.M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2), 238-246.

Bentler, P.M. (2005). *EQS 6 structural equations program manual*. Encino, CA: Multivariate Software.

Bentler, P.M. and Bonnet, D. (1980). Significance tests and goodness of fit in analysis of covariance structures. *Psychological Bulletin*, 88: 588-606.

Brown, T. (2006). *Confirmatory Factor Analysis for Applied Research.* New York, NY: The Guilford Press.

Buckley, J.P., Pass, L.C. and Prescott, K. (1988). Measures of international competitiveness: a critical survey. *Journal of Marketing Management*, 4(2), 175-200.

Byrne, B. (2006). *Structural Equation Modeling with EQS, basic concepts, applications, and programming*. 2th edition, London: LEA Publishers.

Byrne, B.M. (1989). *A Primer of LISREL: Basic Applications and Programming for Confirmatory Factor Analysis Analytic Models*. New York, NY: Springer.

Carter, P. Carter, J., Monczka, R., Slaight, T. and Swan, A. (2000). The future of purchasing and supply: A ten-year forecast. *Journal of Supply Chain Management*, 36(1), 14-26.

Chau, P. (1997). Reexamining a model for evaluating information center success using a structural equation modeling approach. *Decision Sciences*, 28(2), 309-334.

Chou, C.P., Bentler, P.M. and Satorra, A. (1991). Scaled test statistics and robust standard errors for nonnormal data in covariance structure analysis. *British Journal of Mathematical and Statistical Psychology*, 44, 347-357.

Chow, W.S., Christin, N.M, Chu-Hua, K., Min, H.L., Chinho, L. y Hojung, T. (2008). Supply chain management in the US and Taiwan: an empirical study. *Omega*, 36, 665-679.

Coviello, N.E. and McAuley, A. (1999). Internationalization and the smaller firm: a review of contemporary empirical research. *Management International Review*, 39(3), 223-256.

Ferdows, K. and De Meyer, A. (1990). Lasting improvements in manufacturing performance: in search of a new theory. *Journal of Operations Management*, 9(2), 168-183.

Ferry, J., Kevin, P. and Rodney, C. (2007). Supply chain practices, supply chain performance indicators and competitive advantage of Australian beef enterprises: a conceptual framework. Australian Agriculture and resource Economic Society, *AARES 51st Annual Conference*, February, 13-14.

Fornell, C. and Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, l(18), 39-50.

Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1995). *Multivariate Data Analysis with Readings*. New York, NY: Prentice-Hall.

Halley, A. and Guilhon, A. (1997). Logistics behaviour of small enterprises: performance, strategy and definition. *International Journal of Physical Distribution & Logistics Management*, 27(8), 475-495.

Hatcher, L. (1994). *A Step by Step Approach to Using the SAS System for Factor Analysis and Structural Equation Modeling*. Cary, NC, SAS Institute Inc.

Heck, R.H. (1998). Factor analysis: exploratory and confirmatory approaches. In Marcoulides, G.A. (Ed.), *Modern Methods for Business Research*, Lawrence Erlbaum Associates, Mahwah, NJ.

Hong, P. and Jeong, J. (2006). Supply chain management practices of SMEs: from a business growth perspective. *Journal of Enterprise Information Management*, 19(3), 292-302.

Hong, S.F., Luong, L.H.S. and Abhary, K. (2002). Internal supply chain planning detriments in small and medium-sized manufacturers. *Management International Review*, 32(9), 771-782.

Hu, L.T., Bentler, P.M. and Kano, Y. (1992). Can test statistics in covariance structure analysis be trusted?. *Psychological Bulletin*, 112, 351-362.

Hyland, P. y Beckett, R. (2002). Learning to compete: the value of internal benchmarking. *Benchmarking: An International Journal*, 9(3), 293-304.

Ittner, C.D. y Larcker, D.F. (1997). The performance effects of process management techniques. *Management Science*, 43(4), 522-535.

Jiqin, H., Omta, S.W.F. y Trienekens, J.H. (2007). The joint impact of supply chain integration and quality management on the performance of pork processing firms in China. *International Food and Agribusiness Management Review*, 10(2), 67-98.

Jöreskog, K.G. and Sörbom, D. (1986). *LISREL VI: Analysis of Linear Structural Relationships by Maximum Likelihood, Instrumental Variables and Square Methods*. Mooresville, IN: Scientific Software.

Kenneth, W.G., Whitten, D. and Inman, R.A. (2008). The impact of logistics performance on organizational performance in the supply chain context. *Supply Chain Management: An International Journal*, 13(4), 317-327.

Kim, S.W. (2006). Effects of supply chain management practices, integration and competitive capability on performance. *Supply Chain Management: An International Journal*, 11(3), 241-248.

Lockamy, A.III. and McCormack, K. (2004). The development of a supply chain management process maturity model using the concepts of business process orientation. *Supply Chain Management: An International Journal*, 9, 272-278.

McCormack, K., Ladeira, M.B. and Valderes de Oliveira, M.P. (2008). Supply chain maturity and performance in Brazil. *Supply Chain Management: An International Journal*, 13, 272-282.

Mentzer, J.T., Flint, D.J. and Hult, G.T.M. (2001). Logistic service quality as a segment-customized process. *Journal of Marketing*, 65(4), 82-104.

Morrissey, B. and Pittaway, L. (2004). A study of procurement behaviour in small firms. *Journal of Small Business and Enterprise Development*, 11(2), 254-262.

Morrissey, B. and Pittaway, L. (2006). Buyer-supplier relationships in small firms: the use of social factors to manage relationships. *International Small Business Journal*, 24(3), 272-283.

Nunnally, J.C. and Bernstein, I.H. (1994). *Psychometric Theory*. 3ª Ed., New York, NY: McGraw-Hill.

Othman, P., Sungkar, I. and Hussain, W.S.W. (2009). Malaysia as an international halal food hub, competitiveness and potential of meat-based industries. *ASEAN Economic Bulletin*, 26(3), 306-320.

Papke-Shields, K.E., Malhotra, M.J. and Grover, V. (2002). Strategic manufacturing planning systems and their linkage to planning system success. *Decision Science*, 13(1), 1-30.

Power, D. (2006). Adoption of supply chain management-enabling technologies in SMEs: the view from the top vs. the view from the middle. *International Journal of Value Chain Management*, 1(1), 64-93.

Quayle, M. (2002). E-commerce: the challenge for UK SMEs in the twenty-first century. *International Journal of Operations and productions Management*, 22(10), 1148-1161.

Quayle, M. (2003). A study of supply chain management practice in UK industrial SMEs. *Supply Chain Management – an International Journal*, 8(1), 79-86.

Quinn, F.J. (1997). What is the buzz?. *Logistics Management*, 36(2), 43-46.

Ramdas, K. y Speakman, R.E. (2000). Understanding what driver-supply chain performance. *Interfaces*, 30(4), 3-21.

Sardana, G.D. (2004). Determinants of SME success: formulating a business strategy. *Productivity*, 44(4), 572-585.

Sastry, T. (1999). Supply chain strategies for small firms facing high demand uncertainty and seasonality. *Vikalpa*, 24(4), 7-15.

Satorra, A. and Bentler, P.M. (1988). Scaling corrections for chi square statistics in covariance structure analysis. *American Statistics Association 1988 Proceedings of the Business and Economic Sections*, 208-313.

Schuetz, J., Deering, M., Kilpatrick, J. and Derocher, B. (1999). *Energizing the Supply Chain: Trends and issues in Supply Chain Management*. Deloitte Consulting.

Segars, A.H. and Grover, V. (1993). Re-examining perceived ease of use and usefulness: a confirmatory factor analysis. *MIS Quarterly*, 17(4), 517-525.

Selldin, E. and Olhager, T. (2007). Linking products with supply chains: testing Fisher´s model. *Supply Chain Management: An International Journal*, 12(1), 42-51.

Singh R., Sandhu, H.S., Metri, B.A. and Kaur, R. (2010). Relationship organized retail supply chain management practices, competitive advantage and organizational performance. *VISION – The Journal of Business Perspective*, 14(3), 173-190.

Singh, R. (2004). *Supply Chain Management: The Indian Scenario*. Hyderabad: ICFAI University Press.

Söderberg, L. and Bengtsson, L. (2010). Supply chain management maturity and performance in SMEs. *Operations Management and Responsibility*, 3, 90-97.

Thakkar, J., Kanda, A. and Deshmukh, S.G. (2009). Supply chain management for SMEs: s research introduction. *Management Research News*, 32(10), 970-993.

Udomleartprasert, P. y Jungthirapanich, C. (2003). Aligning the infrastructures to supply chain practices. *IEEE*, 5(3), 335-339.

Vokurka, J.R., Zank, M.D. and Kund, M.C. (2002). Improving competitiveness through supply chain management: a cumulative improvement approach. *Competitiveness Review*, 12(1), 14-24.

Vokurka, R. and Fliedner, G. (1998). The journey toward agility. *Industrial Management & Data Systems*, 98(4), 165-171.

Walker, b., Bovet, D. y Martha, J. (2000). Unlocking the supply chain to build competitive advantage. *International Journal of Logistics Management*, 11(2), 1-8.

Wisner, J.D. (2003). A structural equation model of supply chain management strategies and firm performance. *Journal of Business Logistics*, 24(1), 1-26.