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 organizations, mainly 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, 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 to analyze the relationship between supply chain management and the competitiveness of small and medium-sized enterprises, 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, as well as in the financial performance, cost reduction and the use of technology of the small and medium-sized enterprises.

Resumen
La globalización de los mercados y el nuevo ambiente de los negocios esta forzando a las organizaciones, basicamente las empresas pequeñas y medianas, a mejorar su competitividad de manera significativa para poder permanecer en el mercado. Ante eso es necesario modificar las estrategias gerenciales para adaptarlas a los cambios en los requrimientos de los clientes. Para esto la cadena de suministros es una de las estrategias gerenciales que se estan implementando en diversas firmas para incrementar la competitividad. Ante esto el objetivo primordial de este trabajo es analizar la relación entre la cadena de suministros y la competitividad de las PyMEs, utilizando una muestra de 305 empresas en el estado de Aguascalientes. El resultado obtenido muestra que el manejo de la cadena de suministros tiene una influencia positiva en los niveles de competitividad, asi como en el desempeño financiero, reducción de costos y en el uso de la tecnología.

Palabras clave: Cadena de Suministros, Competitividad, PyMES.
Keywords: keywords: Supply Chain Management, Competitiveness, SMEs.

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Palabras Clave:

Introduction

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

Also, the companies have implemented a series of actions to improve their internal operations, such as the increment in the quality of the products and services, accompanied by significant cost reduction, which has allowed the development of higher competitive advantages of the firms in connection with their main competitors, in such diverse 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, which has generated a significant increment in the competitiveness level of the organizations (Vokurka *et al.*, 2002).

In addition, the academic alliance forum (1999) considered that traditional firm competitiveness is changing quickly, in the measure that every day the number of organizations is increased that are implementing supply chain management like a managerial strategy. Ferdows and De Meyer (1990) reached the conclusion that to achieve higher competitive advantages the companies have 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 cost 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 & Swan, 2000).

This way, the suppliers' selection is essential for the business success since is through them that they can improve the significantly materials flows, products, information and funds that are required by companies manufacturers, since these capacities are necessary and basic for all and each and every 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 achieve the costs effectiveness (Crankcase *et al.*, 2000), since only with cost effectiveness it is likely that the goals can be achieved more easily and can improve the 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 an in addition the supply chain management will be guided in efficiency and costs reduction, which will enable 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 their implications about the hypotheses. In the third section the methodology of the investigation is explained. In the fourth section the results are analyzed and, finally, in the fifth section the main conclusions and implications of this study are exposed.

Literature Review

First, we carry out a revision of the literature on the supply chain management in the small and medium-sized enterprises. Subsequently we try to define the relationship between supply chain management and competitiveness level, and the hypotheses and proposed relationships are specified.

Supply Chain Management in the Small and Medium-Size Enterprises

The small and medium-sized enterprises (SMEs) of any part of the world are facing a diversity of problems, derived from the constant changes in market demand and the new type of consumers that are arising in the market (Söderberg & Bengtsson, 2010). This new type of consumers has within its reach a more global offering of products and services, that which increase requirements in terms of service, consistency in the deliveries and the cost reduction and delivery time of the products. Therefore, to be able to fulfill the requirements of the products and services demand, the SMEs have to develop their abilities and knowledge and to apply them in the organizational processes (Lockmany III & McCormack, 2004b; McCormack, Ladeira & Valderes de Oliviera, 2008), and to adopt and implement new managerial strategies wherein the supply chain management is the strategy that every time has more followers.

The increment of the importance of supply chain management as a managerial strategy, can be attributed to two essential elements: the increase of the globalization of outsourcing and the higher emphasis in the products and services quality, associated to the high competitiveness level and business uncertainty (Mentzer, DeWitt & Keebler, 2001). Therefore, the SMEs can improve their competitive advantages by 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 generate as much in the SMEs as in the rest of the firms a higher competitiveness level (Thakkar, Kanda & 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 don't generally have a strong market position and their expansion is very limited, and them to have be successful in the market an acquire competitive advantage, requires to improve significantly their innovation activities like operations and processes, mainly in the areas of inventories, time reduction of the shipments, coordination with their suppliers and practical labor (Thakkar *et al.*, 2010).

In this sense, the literature of the supply chain management area considers a positive relationship between supply chain management and SMEs, since the adoption and implementation of supply chain management activities, help the SMEs overcome the barriers that inhibit their growth and the obtaining of resources through the increment of innovation activities, the significant cost reduction, decrease of business uncertainty and the significant decrease of the accidents rate (Coviello & McAuley, 1999) besides that supply chain management practices are necessary and basic, 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 us to conclude that it empirical evidence exists that relates the supply chain management and SMEs, in which have been identified diverse positive as negatives that show that the practices, including so much of the logistics management as supply chain management are essential to improve SMEs competitiveness level (Halley & Guilhon, 1997; Huin et *al.*, 2002; Quayle, 2002, 2003; Sardana, 2004; Singh, 2004; Morrissey & Pittaway, 2004, 2006; Power, 2006; Arens & Winser, 2005).

Relationship between Supply Chain Management and Competitiveness

The current literature of the managerial sciences area consider 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 & Trienekens, 2007). Moreover, Quinn (1997) 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 the market quick demands in a convenient and reliable way, which can help them to reduce their costs significantly, to increase the productivity and to reduce risks, all of which can be translated as more competitive advantages for the organization (Walker, Bovet & Martha, 2000).

On the other hand, Bagchi (1996) considered that the supply chain activities that 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 that can generate higher competitive advantages to the organizations are those that involve clients, 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 characterizes the current practices regarding the new practices that can be adopted by the company, which can generate a higher competitiveness level. Udomleartprasert and Jungthirapanich (2003) concluded in their investigation that the organizations can improve their competitiveness level if they implement more activities than generate additional value for the clients and suppliers, since only some few of firms are guided to those activities that generate a maximization of their earnings and a reduction of their total costs (production, operation and quality), which can generate a

significant increment in financial performance and business growth (Singh, Sandhu, Metri & Kaur, 2010).

Furthermore, Chen and Qi (2003) concluded that the long term tendency exists in the economy globalization and technologies management that generates a higher competitiveness level in the organizations, since firms can improve their 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 (JOT) and flexible production.

This way, in the last two decades 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 the companies to increase its competitiveness level (Sour, Muddy & 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 to be 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 in large companies as in small and medium-sized enterprises. Also, the integration that SMEs carry 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 have 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 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, which 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 are the most important components 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 service quality, distribution operations and effectiveness in products design that the enterprises offer in the market, are 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 efficiency 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 retailer SMEs are disappearing from the market because of the high competitiveness level, so much in internal markets as in international markets, 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 there 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 generate higher value and more long term competitive advantage. Therefore, in the future SMEs have to be guided in three big tendencies that the market demands: 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 we can think about the following hypothesis:

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

Methodology

To validate the hypotheses proposed in this study we carried out an empiric investigation in the manufacturing SMEs of the Aguascalientes State (Mexico),

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 benchmark 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 the purpose of this paper, they were only those companies were considered that had registered between five and 250 employees (MiPymes), resulting in a final managerial directory with a total of 1,122 companies. The original sample is 333 firms and this was selected by means of a simple random sample with a maximum error of ±4.5 percent and a confidence level of 95 per cent.

In the 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 complying with the established requirements, resulting in a total of 305 validated surveys. This way, a rate of answer of 92 per cent has been obtained. The survey gathered the information on the firm characteristics, supply chain management activities and SMEs competitiveness level. 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.

Development of Measures

For the measurement of the supply chain management construct 20 items were considered adapted from Wisner (2003); all these items were measured by a 5 point Likert scale, ranging from a limits 1 = low importance to 5 = high importance. Moreover, for the measurement of the SMEs competitiveness level we took into account the three factors proposed by Buckley *et al.* (1988): *1) financial performance*, measured by a scale of 6 items; *2) cost reduction*, measured with a scale of 6 items; and *3) technology use*, measured through a scale of 6 items. A 5-point Likert scale measured all the items of the three factors with 1 = strongly disagree to 5 = strongly agree as limits.

Reliability and Validity

For this research paper to evaluate the reliability and validity of the measure scales used in the theoretical model, we 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 proposed were 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 same values of 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 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 estimate pattern. This way, the robust statistics 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, 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 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 high at 0.6 (Bagozzi & Yi, 1988) and the Variance Extracted Index (VEI) of each couple of related constructs is high at 0.5 as it is recommended by 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***	1.000a	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			
Cost Reduction	PC1	0.848***	1.000a	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			

Variable	*Indicator*	*Factor Loadings*	*Robust t-Value*	*Cronbach Alpha*	*CRI*	*VEI*
Technology Use	te1	0.801***	1.000a	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***	1.000a	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-BX2 (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 a confidence interval of 95 percent, 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 with a high correspondent VEI (Fornell & Larcker, 1981). Therefore, we can con-

clude that this investigation paper shows enough evidence of reliability and convergent and discriminant validity.

Table 3
Discriminant validity of the measurement of the theoretical model

Variables	*Financial Performance*	*Costs Reduction*	*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.

Results

Presently the research paper carries out a Structural Equations Model (SEM) to analyze the structure of the theoretical model, and to contrast the outlined hypothesis relating on the one hand supply chain management with SMEs competitiveness level, and the 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: Cost 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 ($\beta = 0.201$ $p < 0.001$), indicate that supply chain management has significant positive effects in the SMEs competitiveness level. The second hypothesis *H2* the obtained results ($\beta = 0.335$, $p < 0.001$), indicate that the financial performance is a good indicator of the competitiveness level. For the third of the outlined hypotheses *H3*, the obtained results ($\beta = 0.328$, $p < 0.001$), indicate that cost reduction is a good indicator of the competitiveness level. Finally, the fourth hypotheses *H4* outlined, the obtained results ($\beta = 0.387$, $p < 0.001$), 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 the one hand, the supply chain management has significant positive effects in the SMEs manufacturing competitiveness level of the Aguascalientes State and, on the other hand, financial performance, purchasing costs reduction and technology use are good indicators to measure the competitiveness level.

Conclusions and Discussion

Actually, 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 their competitiveness level, since for organizations in general but especially for the small and medium-sized enterprises, it is important that they completes in with the delivery of the supplies of raw materials, otherwise the manufacturing SMEs can be seen seriously affected if their orders are not satisfied by the suppliers in the quantities and in the specified time, because the production can have important delays and there would be unfulfilled 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 suppliers, for that reason 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 the result that the 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 client-supplier relationship 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 share information that is generated in the supply channel, otherwise the problems that generated derived from a high level of distrust among the participant firms, can affect the operation and actions 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 implement a higher level of collaboration with their clients and suppliers, with the pur-

pose of efficiency in the information exchange in 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 to have an application of a feedback strategy among the participant companies, since the activities of collaboration involve all the actors of the supply chain; besides, that represents a security 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 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 besides the clients and suppliers who should be involved are the middlemen who have an important participation in the efficiency of the supply chain management. Therefore, the efforts that should highlighted in the supply work should involve the supplier's responsibility for 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, the ones who have a bigger knowledge of the problems who are the responsible ones for managing the chain of supply of the organizations should listen so that they are eliminated to the the problems to the extent.

On the other hand, it is important to recognize that this research 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, a reason why in future studies 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 in the obtaining of the information, because it 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

the implication that it will be indispensable to incorporate quantitative variables or data in future studies 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 the information was requesting was highly confidential and private, for which reason the data provided by the SMEs does not necessarily reflect the reality with regard to the analyzed variables.

A third limitation is the one that refers to the measurement of the variables used in the scale of the supply chain management and 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 Likert type of five points for the financial performance, cost reduction and technology use), a reason which in future studies it will be important to increase the number of items and to use a Likert type scale of more punts to check the results.

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

Lastly, is it considered extremely important to analyze beyond the results obtained in this research paper and to discuss with more depth what the effect would be to have the supply chain management in the competitiveness level if a scale is used with quantitative data? What results would be obtained in manufacturing SMEs of Aguascalientes State if a different scale is used to measure the supply chain management? What 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.

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