

## Logistics Flexibility Effect on Manufacturing SMEs Competitiveness

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### Abstract

Currently, firm's dynamics urges management strategies to meet globalized market requirements. This study analyzes the impact of Logistics Flexibility on Competitiveness of Mexican manufacturing SMEs. By using the structural equations modeling and path diagram techniques, it shows the effects of the relationship hypothesized. Managerial significance of results strengthens decision taking and public policy making, providing essential information to managers, owners and human capital of firms' internal capacities and allocation of their strategic resources.

**Keywords:** Logistics flexibility; Competitiveness; Manufacturing; Small and medium enterprises (SMEs); Resource based view (RBV).



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### 1. Introduction

As the level of customisation of products, variety and quality grows, demand becomes more intense and global. Under this scenario, it is inevitable for firms to deal with constant changes. To survive, they must appreciate flexibility even if they lack information and knowledge (Shi and Daniels, 2003). Within this business dynamic, change is the reason for flexibility and environmental uncertainty, its unexpected occurrence moulds the inner and outer manufacturing firms perspective (Corrêa and Gianesi, 1994). Such characteristics are a reason for manufacturing environment to be studied (Jain *et al.*, 2013). Accordingly, competitiveness in firms creates a necessity to understand the relevance of flexibility as an ability to change or react to business issues.

As a strategy to manage several kinds of uncertainty (Sawhney, 2006), flexibility, is recognized in literature, as a tool to deal with environmental disturbances through constant transformation that supports working routines and business procedures by matching organizational responses to external demands (Fredericks, 2005). According to recent developments, the industrial environment considers flexibility an invaluable firm strategy to deal with not predictable changes in demand (Francas *et al.*, 2011). It is also, a crucial task to fit industry and achieve global success (Duclos *et al.*, 2003a). This represents a competitive requirement in terms of resources and capacities usage within manufacturing settings.

As one of the most important economic activities in the world, manufacturing has a considerable industrial impact on countries and societies (Hassan *et al.*, 2013). Its role on economic growth and development of regions is crucial (Pilat *et al.*, 2006) in search for competitiveness. This strategical vision requires and considers flexibility, an important organisational requirement for production (Patel, 2011; Patel *et al.*, 2012). As a consequence of analyzing how flexible a firm is, a new horizon for intra-firm and inter-firm flexibility (Fredericks, 2005) places a logistic intervention where buyers and suppliers adapt and modify their shared relationship of exchange (Sezen and Yilmaz, 2007). Furthermore, this logistical type of flexibility improves resources usage and helps manufacturing settings cope with intro and outer disturbances (Jain *et al.*, 2013).

Since the resource-based view (RBV) vision can not completely explain such interaction, because superior performance no longer represents a sustainable competitive position by exclusively considering the valuable resources and available capabilities that generate competitive advantages (Wernerfelt, 1984). In the need for new developments related to the direct and indirect complementary junction of manufacturing flexibility (Vokurka and O'Leary-Kelly, 2000a) logistics flexibility is closer to the idea of a dynamic capability to access sustainable competitiveness whose continuous improvement prevent a competitive position of the firm (Tece *et al.*, 1997).

Furthermore, in terms of flexible manufacturing (Stevenson and Spring, 2007), logistics is considered one of its research lines in operations management (Yu *et al.*, 2012). Nonetheless, logistics flexibility concept still lacks appreciation and often underrates services (Stevenson and Spring, 2009) and internal functions (Stevenson and Spring, 2007), to intra-firm or dyadic relationships (Stevenson and Spring, 2009). This transition helped recognize Logistics Flexibility as a complex, multidimensional concept in theory and practice that can be empirically tested.

Most of literature towards flexibility relates to firms commonly found in manufacturing industry (Brettel *et al.*, 2016; Gerwin, 1993; Sethi and Sethi, 1990). But the lack of a clear link between Logistics Flexibility and Competitiveness creates a gap over the configuration of constructs. Literature development has not moved towards empirical studies that join these constructs to expand theory. Nevertheless, there are theoretical insights of the RBV evolution of flexible production systems into Logistics Flexibility that truly adapt to intra-organisational resources and capacities.

This study follows The Marketing Science Institute (MSI, 2016) vision that considers strategical integration, as a means to share benefits and produce positive effects on firms. This vision, takes into consideration insight on logistics flexibility as a priority to increase Competitiveness in Supply Chains. Consequently, its study represents a potential contribution to theory, extending the RBV by breaking the traditional firm boundaries of Flexibility.

While studying the relationship of the constructs, the proposed theoretical model and the methodology used, allow an empirical test that articulates causality of the constructs bearing in mind that it is not possible to be competitive if firms are not logistically flexible previously (Bolwijn and Kumpe, 1990). This criteria is useful to clarify the link and effect among constructs and prove that in spite of misleading theory developments, evidence for further research can be provided. In the next sections, a theoretical background for the research is summarized along with a conceptual model and hypotheses development. Then, methodology, analyzes carried and obtained results are observed just before the discussion of findings, limitations and conclusions is acknowledged.

## 2. Literature Review and Formulation of Hypotheses

The industrial revolution changed the way production, machines and humans interact. Ever since the need to satisfy markets emerged, production systems have always tried to configure such interaction in order to adapt to consumption reality. As soon as industrial developments started to be shown in literature, theory recognized the possible loss of a market position when a firm was not capable to react. Eventually, at the operational management field, this introduced the ability to meet market needs controlling costs, time and possible disruptions (Upton, 1994).

After all the big and broad manufacturing flexibility development of theory (Gupta and Goyal, 1989a; Sethi and Sethi, 1990), that recognized the very first classifications and definitions (Gupta and Buzacott, 1996; Slack, 1983; Upton, 1994), and its initial measurement options (Zelenovic, 1982), (Chatterjee *et al.*, 1984), in terms of production systems. The next stage of development recognized a transition of manufacturing that focused more on its impact on performance or financial results (Mahmoodi *et al.*, 1999; Tsubone and Horikawa, 1999). Despite all that previous knowledge, a new era of business, where firms adaptability need surpassed those traditional views of firms, to comprehend and reveal opportunities from a logistics perspective to really assess their competitive business strategy in terms of production to restructure market (Persson, 1991). Consequently, managerial strategic shifts, got influenced by logistics in every resources coordination, improvement, restructuring or adaptation, while dealing with competitive forces to develop new business areas or services. Such competitive landscape of manufacturing, tries to build a sustainable higher form, where advantages interaction need strategic flexibility to rethink firms' operation (Hitt *et al.*, 1998).

Once competitive priorities changed among manufacturers (Takala, 2002). from cost into quality and customer focus, competitiveness acquired a broader understanding in manufacturing firms (Leong *et al.*, 1990). The term Flexibility was recognized as the ability to deploy or re-deploy resources when changes in design, planning, volume and product variety are met (Kazan *et al.*, 2006). The former definition is important, nonetheless differs from manufacturing flexibility, in developing and using capacities that deploy a major level of dynamism, where internal production processes of human resources add value to a conjoint perception of product and business service from the customer (Bowersox *et al.*, 1989).

For this research purposes, flexibility is a potential factor in creating a long-term competitive scenario, that goes beyond simple competitive advantages in firms where business strategy regards logistics (Fawcett *et al.*, 1996). Consequently, Logistics flexibility is seen as the ability to respond quickly and efficiently to changing customer needs in inbound and outbound delivery, support and services (Zhang *et al.*, 2005). According to the resource base theory, profitability must be a sustainable feature of competitiveness, in terms of production, to be appropriate for firms from a financial or firm performance perspective (Hamel and Valinkangas, 2003). Unfortunately by itself, does not guarantee the right usage of resources and capacities to achieve strategic management allignment, other qualitative factors related to competitiveness should be considered. The successful fulfillment of those needs drive firms in the direction of competitiveness.

From a logistics point of view, this inter-play of resources and capacities is also achievable in manufacturing settings if firms can appreciate such dynamics. For this reason, business competitiveness is considered related not only to financial development or results. Buckley *et al.* (1988), developed a referential framework to measure such concept, a combination of management assets and process, and established such condition on firms capable of producing and delivering goods and services of higher quality and lower cost than their competitors at a global scale. Following the resources and capacities principle, that apply for industries as well as countries, Camisón and Villar (2010), understood the capacity to establish a distinctive product and offered service, to finally go back to the territorial scale that also applies to firm scenarios where domestic or export traditional vision resembles organizational, commercial sectors of firms (Bhardwaj *et al.*, 2007; Romo and Abdel, 2005). Nevertheless, for management purposes, it embodies a capacity that ascends from human resources, whose skills in an organization are convenient for firms.

Reactiveness, resource limitations, use of limited resources, informal strategies and flexible structures are some of the characteristics that make SMEs proclive of flexibility need in theory and practice (Hudson *et al.*, 2001).

Within the manufacturing sector, SMEs constantly face competition from cheaper products (Terziowski, 2010). Consequently, the manufacturing sector tends to focus on process improvements where competitiveness, reduce costs by formalizing flexible structures. Despite logistics flexibility is a tool to increase manufacturing response, in practice it is not easy to be used by managers nor easy to make decisions based on it. This practical difficulty reveals the level of confusion in literature development. All the different visions make it difficult to grasp as an integrative idea that can be empirically tested. Since every firm understands flexibility based on its own experience, it is difficult to find the whole view on manufacturing (Jain *et al.*, 2013). Unless competitiveness receives its logistics effects firms can not their level of flexibility.

One of the main difficulties of the theory is the lack of clarity in the definition (Sethi and Sethi, 1990). In this view, manufacturing flexibility must be seen as a fundamental tool to cope with environmental uncertainty and turbulent markets (Oke, 2005). In spite of the fact that the direct relationship among the concepts has been proved (Swamidass and Newell, 1987), sometimes the effects have been different, moderated or contingent (Ward *et al.*, 1995), and non-significant. (Pagell and Krause, 2004), This lack of consistency urges to assess its real effects on organizational performance and determine logistics flexibility is capable of improving organizational performance or not (Camisón and Villar, 2010b). Since the RBV centres attention on unique resources that differ among firms, the relationship between logistics flexibility and competitiveness needs to explore other theoretical alternatives that make them common and promote substitution of processes to allow success in a more integral perspective.

According to a previous development, theory identifies three moments of manufacturing flexibility development (Camisón and Villar, 2010b), uncertainty environments (Swamidass and Newell, 1987) (Newman *et al.*, 1993; Pagell and Krause, 2004; Sethi and Sethi, 1990), empirical trend based on antecedents and contingents (Gennard and Kelly, 1993; Hutchison and Das, 2007; JjLau, 1999; Narasimhan *et al.*, 2004), and relationship between manufacturing flexibility and performance per se (Narasimhan and Das, 1999; Souza, 2006), or more specifically firm performance (Jack and Raturi, 2002; Pagell and Krause, 2004; Swamidass and Newell, 1987; Ward *et al.*, 1995). In spite of all the definitions of flexibility in terms of manufacturing (Koste and Malhotra, 1999), a general common ground refers to the ability of a manufacturing system, understood as flexibility, to respond to environmental uncertainties in an integral setting to break the idea that it is relative and depends on a set of alternatives to obtain its magnitude. Instead, it should be addressed as a whole (Tidd, 1991).

Due to the improper systemic understanding of complexity within logistics context, flexibility in firms relationships, has been limited to TQM practices (Camisón and Puig-Denia, 2015). When firms accomplish flexibility in manufacturing, they can establish flexible methods and proper external relations. In addition to the aforementioned perspective, resource-based view (RBV) extends comprehension by considering firms as bundles of distinct resources (Wernerfelt, 1984) possibly unique as capabilities to generate rent or competitive advantage (Barney, 1991; Day, 1994). In spite of the fact that RBV is relevant to logistics, it is important to see if their flexible allocation and utilization (Olavarrieta and Ellinger, 1997), is related to Competitiveness. Thus, based on the above discussion, this research offers the following hypotheses:

**H1:** *Logistics flexibility has a positive and significant effect on Competitiveness of Manufacturing SMEs.*

The revision of literature is related to the most important papers from the development where our contribution can be stated. One of the priorities of strategy in terms of flexibility is to invest in flexible resources, price and cost differentials as well as the correlation of demands (Van Mieghem, 1998). This blend is important to manufacturing industry because different inputs in process define the range of flexibility (Kulkarni and Francas, 2017), nevertheless, all background in the matter covers firms without any flexibility, direct or indirectly connected configurations and totally flexible arrangements (Jordan and Graves, 1995). Still, the overall firm flexibility has not been properly examined, considering that manufacturing firm flexibility can be assessed in the supply chain context (Jin *et al.*, 2010).

As a scientific discipline, beyond physical distribution, transportation and inventory management; Logistics fits business (Kovács and Spens, 2005) in a more rigorous orientation, aiming for theory, testing and application development. While theory struggles with all the concepts, frameworks and categories developed, in between those tasks and structures, flexibility emerged in logistics activities (Ballou, 2006; Cooper *et al.*, 1997) as a strategy that can be developed. Flexibility, Agility and responsiveness are some concepts that need to be clearly distinguished to avoid the previous literature misconceptions and overlap in the supply chain logistics context. In this regard, Agility is an overall capability of an organization that involve processes within a firm, its suppliers and customers, flexibility is just an antecedent of it Swafford *et al.* (2006). Following this argument, Responsiveness is the ability to respond and adapt, read and understand the market signals considering time (Catalan and Kotzab, 2003).

To maintain consistency with literature and statistical validity, the transition from cost to quality in firms became crucial to increase their competitive priorities from a global scenario (Kumar and Motwani, 1995) helped to identify the lack of the required flexibility as a gap in empirical research. Literature shows that flexibility has been assessed by researchers in two approaches: quantitative and qualitative, either to quantify or describe the phenomenon. (Shewchuk and Moodie, 1998). But logistics flexibility is more complex and underrated in literature. Consequently, Its measuring is more complicated. One possible solution to solve the above mentioned, is path analytic modeling (Swamidass and Newell, 1987), whereas structural equations can identify all the possible relationships among constructs. Since literature recognized a lack of well-accepted operationalization of flexibility measures (Gerwin, 1987) in terms of logistics this study relates its effects on competitiveness to fulfill that gap in a boundaryless competitive vision (Zairi, 1997).

Verdú-Jover *et al.* (2006), identified different dimensions of managerial flexibility and found that they have positive implications for performance if they are in line with requirements of the environment. Likewise Martínez-

Sánchez and Pérez-Pérez (2005), empirically measure performance oriented competitiveness in response to flexibility in logistics context. Their findings confirmed a sustainable competitive response of firms to flexibility in logistics settings. (Merschmann and Thonemann, 2011), measure flexibility and firm performance considering logistics a key element of its relationship. Their empirical results showed a positive significant effect as a whole measurement component. Such implications were theoretically referred before by Narain *et al.* (2000) as well as their strategic formulation in firms (Nemetz and Fry, 1988), as hole capability related to performance (Zaheer and Bell, 2005), suitable for empirical study (Vickery *et al.*, 1999).

Accordingly to resource based- view insights, being flexible is a capability that allows competitiveness to be a dependent variable in empirical testing of performance (Ray *et al.*, 2004). Competitiveness in manufacturing is a matter of different visions to look after similar results considering performance a likewise concept (Sahin, 2000). Both terms have a resulting figure from product competition (Sanchez, 1995). In the end that condition leads productive tasks for firms benefit (Zelenovic, 1982). Fantazy *et al.* (2009), established the relationship among strategy, flexibility and performance in logistics industrial settings, that also applies for integration practices in manufacturing (Ellinger *et al.*, 2000), where flexibility is a means to develop competitiveness (Fantazy *et al.*, 2012). Confirmed by the research agenda of previous manufacturing studies (Gerwin, 1987). Kebler and Plank (2009), analyze measurement of logistics performance within supply chain, considering competitiveness and important concept to be assessed in manufacturing in response to critical factors (JjLau, 1999), recognized in the dimensions of flexibility (Koste *et al.*, 2004).

Zhang *et al.* (2005), empirically tested a sustainable competitive advantage based on customer satisfaction impact to identify in there was a positive effect on that perception. Their findings showed a significative impact on the hypothesized relationship. As a given condition for production and operations (Slack, 2005) that is also related to financial performance when different relationships are observed (Vickery *et al.*, 2003).

### 3. Methodology

In order to conduct research and assess the aforementioned hypothesis, an empirical investigation was carried out in the state of Aguascalientes, México, considering the business directory of the National Institute of Statistics and Geography (INEGI), particularly the Statistical Directory of Economic Units (DENUE) as a reference to obtain data. A questionnaire survey was designed and personally applied (during the first semester of 2017) by means of a personal interview to managers or owners of some of the directory firm members. The sample size was statistically determined using a simple random method. The result, an amount of 302 survey questionnaires out of a 5176 universe of manufacturing SMEs were needed. Reliability level of error of the sample was +/- 5 percent.

**Table-1.** Research Design

Universe	5176 SMEs
Scope of study	Aguascalientes city, México
Sample unit	Manufacturing SMEs of Aguascalientes
Method of data collection	Questionnaire
Sample size	302 SMEs of Aguascalientes
Sample error	5%
Confidence level	95%

Source: Authors of this study

From theory, two measuring scales were used to obtain and assess data. The first construct, Logistics Flexibility adopted Zhang *et al.* (2005) vision of four different dimensions to accomplish its measurement: physical supply, purchasing, physical distribution and demand management. Similarly, the second construct, Competitiveness, uses three dimensions: financial performance, cost reduction and technology use. The former was adapted from Buckley *et al.* (1988) by Maldonado *et al.* (2012). Both are considered latent. In summary, Logistics Flexibility, uses a multi-item Likert scale that contains common categories in literature, according to its authors and fit manufacture environment (Zhang *et al.*, 2005). On the other hand, Competitiveness is also a five-point, multi-item Likert scale, its categories are adapted from literature, according to its authors (Maldonado *et al.*, 2012). All surveys used ranging from 1=total disagreement to 5=total agreement, helped assess the manager's perceptions of selected manufacturing firms.

The scales used, demonstrated adequate psychometric properties referring internal consistency through acceptable values of the Alpha coefficient. They also meet the variance extracted and construct reliability measures suggested by Fornell and Larcker (1981). According to theory, independent measurement of constructs allows resulting scores to be more accurate than any of the individual items by accounting a unique factor and error measurements that may also affect the item (Chin and Gopal, 1995). For practical purposes of this study, dimensions of first-order factors become the observed items of the second-order factors. The proposed research model measures first order factors with reflective indicators for every construct. Then, second-order factors are measured. This decision is based on the perception of each dimension as a cause or an indicator of a second-order factor (Chin and Gopal, 1995).

The first step to use a Structural Equation Model (SEM) is assessing the reliability and validity of scales through a confirmatory factor analysis (CFA). For measuring internal consistency of the constructs, Cronbach's alpha coefficients and reliability index (IFC) (Bagozzi and Yi, 1988) were used. For internal consistency and

convergent validity purposes of data, three widely known analysis structural modeling were made: Cronbach's alpha (Nunnally and Bernstein, 1994), composite reliability index (CRI) (Bagozzi and Yi, 1988; Fornell and Larcker, 1981) and average variance extracted (AVE) (Fornell and Larcker, 1981). All values were obtained using the EQS 6.3 software (Bentler and Wu, 2005; Byrne, 2006).

Table-2. Internal consistency and convergent validity

Variable	Parameter	Factor Loadings	t value	Cronbach's Alpha	CRI	AVE
Physical Supply Flexibility (F1)	PS1	0.808***	1.000	0.925	0.925	0.713
	PS2	0.824***	16.509			
	PS3	0.884***	18.253			
	PS4	0.867***	17.748			
	PS5	0.838***	16.919			
Purchasing Flexibility (F2)	PF1	0.837***	1.000	0.93	0.965	0.847
	PF2	0.873***	19.289			
	PF3	0.920***	21.088			
	PF4	0.854***	18.593			
	PF5	0.782***	16.175			
Physical Distribution Flexibility (F3)	PD1	0.886***	1.000	0.907	0.978	0.916
	PD2	0.817***	18.420			
	PD3	0.806***	17.987			
	PD6	0.860***	20.206			
Demand Management Flexibility (F4)	DM1	0.831***	1.000	0.839	0.919	0.792
	DM2	0.885***	16.606			
	DM4	0.697***	12.879			
Logistics Flexibility	F1	0.799***	12.721	0.839	0.884	0.658
	F2	0.770***	12.662			
	F3	0.900***	15.766			
	F4	0.768***	12.035			
Financial Performance (F5)	FP2	0.893***	1.000	0.909	0.920	0.747
	FP3	0.977***	29.448			
	FP4	0.918***	25.569			
	FP5	0.617***	12.441			
Purchasing Costs (F6)	PC1	0.718***	1.000	0.902	0.904	0.703
	PC3	0.889***	14.971			
	PC4	0.925***	15.435			
	PC5	0.808***	13.639			
Technology Usage (F7)	TE2	0.937***	1.000	0.959	0.959	0.855
	TE3	0.962***	35.251			
	TE4	0.919***	29.616			
	TE5	0.879***	25.724			
Competitiveness	F5	0.512***	3.963	0.857	0.503	0.277
	F6	0.709***	4.080			
	F7	0.259	3.143			

S-BX<sup>2</sup> = 86.8986; df =49; p= 0.001; NFI= 0.972; NNFI= 0.983; CFI= 0.988; RMSEA= 0.051;

<sup>a</sup> = Constrained parameter value in this identification process. \*\*\*=p<0.01

In order to test reliability, three different measures were assessed. First, the confidence interval test (Anderson and Gerbing, 1998), states that the inferior and superior values must not include 1.0 in between. Afterwards, the test of average variance extracted (Fornell and Larcker, 1981) remarks that AVE values must be superior than the squared correlation of each pair of constructs. Since all criteria are met, the model can be considered good in terms of reliability, convergent and discriminant validity. Shown on the table, AVE values appear transversely, confidence interval test values are exposed above and squared correlations below the diagonal black bold values. The estimation of th factors was 95% on confidence intervals.

Table-3. Discriminant validity of the theoretical model

Factors	Logistics Flexibility	Competitiveness
Logistics Flexibility	0.707	0.169, 0.377
Competitiveness	0.075	0.768

## 4. Results

T statistics-tests do not show significant differences at a 5% significance level, which proves there is not a responsive bias. Data sample was obtained from a heterogeneous arrangement of firms, which favoured research findings. All the Cronbach's Alpha values were obtained for each scale exceeding the suggested and generally accepted value of 0.7, which means there is a high level of reliability (Nunnally, 1978). Therefore, goodness test for flexibility was obtained (Gupta and Buzacott, 1996).

The results of the AFC are shown in table two and show that the scales used to measure the model have acceptable adjustment indices ( $S-BX^2 = 233.48$   $df = 133$ ,  $p = .001$ ,  $NFI = 0.914$ ,  $NNFI = 0.944$ ,  $CFI = 0.954$ , and  $RMSEA = 0.060$ ), in the table we can also observe that all the factorial loads are higher than 0.60 what according to Bagozzi and Yi (1988) indicates that they are significant and also indicate a high consistency of the constructs. Another measure of the reliability of the constructs is the value of Alpha de Cronbach whose value in all dimensions exceeds the 0.70 recommended by Hair *et al.* (2010). Likewise, the extracted variance index (IVE) was calculated showing that all values exceed the 0.6 recommended by Fornell and Larcker (1981).

Table-4. Results of the structural model

Hypothesis	Structural relationship	Standardized Coefficient	Value t Robust
H1: Logistics Flexibility has a positive and significant effect on Competitiveness	LF $\rightarrow$ COMP	0.530***	6.90
<b>S - BX<sup>2</sup> = 576.1633; df = 95; NFI=0.911; NNFI=0.923; CFI=0.932; RMSEA= 0.079</b>			

\*\*\* =  $p < 0.01$

Accordingly to results ( $\beta = 0.530$ ,  $p < 0.01$ ), confirms a positive and significant effect of Logistics flexibility on Competitiveness. Therefore, the causal relationship is accepted and important managerial implications are elicited.

## 4. Concluding Remarks, Limitations and Future Research

This article provides directions for future research on supply chain integration incorporating two critical concepts: logistics flexibility and competitiveness. Consequently, it accessed an important research gap by identifying and utilizing three theoretical frameworks because integrative research lacks this kind of basis. Knowing that a single theory has limited authority to explain supply chain and logistics management, instead a combination with other can generate a thorough understanding of an integrative vision scheme, this article offers a new scope to study flexible and settings in manufacturing in search of competitiveness.

A literature lack of antecedents of integrations (Pagell and Krause, 2004), allow this study to contribute to strategic priorities of firms. Results will enable managers to identify key drivers and therefore set, adapt or change their strategies. Furthermore, most studies have suggested a positive link between supply chain and performance, logistics and performance or innovation and performance; but together as part of a theoretical model, these constructs have never been addressed. This study comprehends the importance of flexibility but does not intend to assess innovation as an integrative concept that enhances competitiveness in spite of technology use as a dimension of competitiveness.

The main objective of this research was to know the impact that logistics flexibility has on competitiveness of Mexican SMEs, the findings indicate that the impact is direct and positive, these results indicate that logistics flexibility must be looked after in manufacturing SMEs because it is one of the main capacities they need to develop if they want to boost competitiveness.

As future lines of research, It is recommended to analyze the effect that increasing the company competitiveness could have on their future performance to anticipate for the allocation of resources and strategies to reduce risk of investment. In general the results of this study suggest that firms should continually look for flexibility. Reducing complexity allows firms practical understanding of the concepts in a simple but integrative manner. Then manufacturing firms can systematically introduce new strategies and ensure employees commitment. This study may be a guideline to differentiated firms.

## Acknowledgements

To the Universidad Autónoma de Aguascalientes for giving me the opportunity to be in the UK and learn more about research. In particular to Dr Sandra Yesenia Pinzón Castro for all her support and willingness to let me access this opportunity and Dr Gonzalo Maldonado Guzman who believed and made possible this experience. To Consejo Nacional de Ciencia y Tecnología (Conacyt) in México for providing the financial support necessary to develop this research period in the UK. Not less important, to all the individuals who provided eliminate any help and support to this task, their friendship and shared eliminate any knowledge to this experience. To my family because nothing makes sense if it is not shared with them. Thank you all.

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