# Determinants of competitiveness and productivity of Mexican SMEs and their relationship with vertical integration

# Determinantes de la competitividad y productividad de las pymes mexicanas y su relación con la integración vertical

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**Abstract:**

The development of a company is conditioned by its ability to be competitive and productive, however, today there are aspects of utmost importance that have become key factors to achieve this, such as technology, innovation of organizational processes, the ability to market their products and enter new markets, as well as offering a higher quality of them. The strategies to achieve this are vertical integration, distribution channels, sales, age and size of the company, which become part of globalization and its implications in the competitive market, generating a higher growth and productivity level. The objective of this study was to identify the factors that determine the competitiveness of the textile and apparel industry of Mexican companies. This process was carried out by means of the Bivariate statistical method, and a significant correlation was found with the characteristics of the company, marketing channels, percentage of sales and its relationship with vertical integration.

*Keywords:*

*Competitiveness, productivity, small and medium, vertical integration, commercialization*

**Resumen:**

El desarrollo de una empresa está condicionado por su capacidad de ser competitivo y productivo, sin embargo, hoy en día existen aspectos de suma importancia que se han convertido en factores clave para lograrlo, como la tecnología, la innovación de los procesos organizacionales, la capacidad de comercializar sus productos e ingresar a nuevos mercados, así como ofrecer una mayor calidad de los mismos. Las estrategias para lograrlo son la integración vertical, los canales de distribución, las ventas, la antigüedad y el tamaño de la empresa, que se hacen parte de la globalización y sus implicaciones en el mercado competitivo, mostrando un mayor nivel de crecimiento y productividad. El objetivo de este estudio fue identificar los factores que determinan la competitividad de la industria textil y del vestido de las empresas mexicanas. Este proceso se realizó mediante el método estadístico bivariado, y se encontró una conexión significativa con las características de la empresa, canales de comercialización, porcentaje de ventas y su relación con la integración vertical.

*Palabras Clave:*

*Competitividad, productividad, pequeñas y medianas empresas, integración vertical, comercialización*

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## Introduction

This research belongs to the activities developed by the Academic Body of Management and Business Development of the Instituto de Ciencias Económicas y Administrativas (ICEA) of the Universidad Autónoma del Estado de Hidalgo (UAEH), and whose objective was to determine the factors of competitiveness through the analysis of marketing channels and the percentage of sales and their relationship with the vertical integration and characteristics of Mexican companies in the textile and clothing industry

The development of the company through vertical integration arises from the competitive advantage based on its production methods and organization, which are reflected in the price and quality of the final products, these in comparison with those of the competition [1-3]. In the research results obtained from the analysis of the factors involved in the competitiveness of the textile and apparel industry of Mexican companies, the variables company characteristics, marketing channels and percentage of sales were considered to measure their relationship with vertical integration, and to know the degree of association between these variables.

## Vertical integration

A company is vertically integrated if it is involved in a stage of production or distribution of goods and services. To understand what is meant by stage of production, the production functions are located, where the functions can be seen as a common or alternative process subdivided into all the separate operations. Each of these operations are a separate stage of production. Vertical integration is the act of combining two or more stages of production into a common ownership, where control is through the existence of links between industries at the same grade in the chain, whereby a company attempts to strengthen its supply chain, reduce production costs and also access new distribution channels [4-5].

The demands of competitiveness and productivity have an enormous impact on what today is called "Organization of the Future", which is considered as a human entity that materially is able to emerge and adapt easily to new times [6]. On the other hand, the flexibility that the company has to innovate, understanding innovation as the representation of a new idea, method, device or a change made in a product, idea or existing field [7], will allow it to create new ways of organizing work and the fusion that these have with recent technologies together with learning and educational preparation of human resources, depends largely on the company to increase its competitiveness and productivity [8].

## Competitiveness in the textile industry

Today, Mexican textile companies have had to develop in order to compete in the market, although the relationship between competitiveness and market share is generally weak and in many industrial sectors is nonexistent [9]. Within this type of companies, the textile and clothing industry is characterized by having large volumes of labor force in its production process, and by a weak competitiveness in international markets both export and import, it is precisely in small and medium enterprises where the greatest marketing problems are concentrated, generated by the use of several marketing channels that as a result affects their percentage of sales, and moreover, for not having a vertical integration strategy that allows you to establish new business strategies [10]. Vertical integration can reduce transaction costs and alleviate uncertainty, but its effects are not always positive: integration requires additional coordination within the company, which can be costly and can reduce competition [11].

Although companies struggle daily to stay in the market, in order to be better than their competitors, they have to satisfy their products and the needs of their consumers, using current management techniques [12]. The objective of this research work is to be able to carefully observe their performance, especially in those factors that help their competitiveness and productivity and the way they implement their strategies of improvement and technological innovation, as well as the drivers of their business development, which we can translate as economic success, with this we will obtain the factors that contribute to the growth of companies in terms of administrative practices, which come to be sources of competitive advantage in the conquest of their respective markets.

## Methodology

The research was conducted under a non-experimental, cross-sectional, ex post facto design with the purpose of identifying the association of the variables, expressed in their ability to generate marketing channels and sales percentages in relation to the characteristics of the company and the importance of vertical integration according to the development of competitiveness as organizational purposes. A questionnaire with 44 items was integrated to measure the variables included in the study, based on Harrigan's theoretical model [13]. A total of 125 companies from the textile and apparel industry participated in the study, located in the state of Hidalgo located in the municipalities of Actopan, Pachuca de Soto,

Tepeji del Rio de Ocampo, Tizayuca, Tula de Allende, Tulancingo de Bravo, and Zacualtipan.

The symbology used in the tables to identify the factors is as follows:

F1 = Number of stages the company developed to become vertically integrated.

F2 = Number of vertically integrated forward production stages in yarns and fabrics of soft fibres.

F3 = Number of vertically integrated backward production stages in yarns and fabrics of soft fibres.

F4 = Number of production stages vertically integrated forward in fibres and fabrics of hard fibres.

F5 = Number of vertically integrated backward production stages of hard fibres.

F6 = Forward integration of other textile industries.

F7 = Number of vertically integrated production stages backwards from other textile industries.

F8 = Number of vertically integrated production stages forward with garments.

F9 = Number of vertically integrated backward production stages of garments.

F10 = Number of vertically integrated backward production stages of leather and footwear.

F11 = Breadth of vertically integrated activities.

F12 = Percentage of ownership of embedded units

In Table 1 shows the production systems used by the companies for the production of their products, highlighting the production systems by order and in line, which reflects that there are periods of high and low demand, so it is common to hire staff seasonally.

## Results

Table 1

Production systems used by the textile and clothing industry in the state of Hidalgo

| Range of production systems | Number of companies | Percentage (%) |
|---|---|---|
| Production system by Order | 50 | 40.0 |
| Production system in Line | 40 | 32.0 |
| Production system by Lots | 10 | 8.0 |
| Production system Continues | 18 | 14.4 |
| Production system Modular | 8 | 5.6 |
| Total | 125 | 100.0 |

In Table 2, when performing the multiple linear regression analysis, significant associations were found between the

independent variable firm size with the factors F1, F2 and F3 of the dependent variable vertical integration. As well as between the independent variables Export sales through intermediaries, Direct export sales and Others with the factor F5 of the dependent variable vertical integration.

Table 2

Results of multiple linear regression analysis

| Independent variables | Dependent Variable | | | | | |
|---|---|---|---|---|---|---|
|  | F1 | F2 | F3 | F4 | F5 | F6 |
| Characteristics of the company: | | | | | | |
| Age | -.003 | .000 | .025 | -.006 | .006 | .029 |
| Size (number of workers) | .231* | .540** | .485** | .033 | .004 | -.099 |
| Marketing Channel | | | | | | |
| Own shops | .037 | -.061 | -.008 | -.031 | .121 | .081 |
| Catalog Sales | -.145 | -.142 | -.076 | .038 | -.130 | -.213 |
| Online sales | -.058 | -.037 | -.121 | .077 | -.042 | .124 |
| Sales to intermediaries Wholesalers | .117 | -.098 | -.030 | -.101 | .010 | .145 |
| Sales to intermediaries Retailers | .044 | -.032 | -.014 | -.093 | -.004 | -.089 |
| Sales to stores Departmental | -.163 | -.002 | -.001 | -.103 | -.140 | -.253 |
| Sales to self-service stores | -.129 | .080 | .079 | .102 | -.050 | .187 |
| Export sales through intermediaries | .017 | -.105 | -.087 | -.091 | .436* | .065 |
| Export Sales Direct | -.103 | .160 | .159 | -.114 | .277* | -.029 |
| Other | -.041 | -.050 | -.045 | .042 | .189* | .040 |
| *R* | .488** | .598** | .557** | .256 | .593* | .370* |
| *R2* | .238 | .358 | .310 | .066 | .351 | .137 |
| *R2 Adjusted* | .157 | .289 | .236 | -.034 | .282 | .045 |

Standardized coefficients are reported. N = 125.

\* $p < .05$

\** $p < .01$

In Table 3, when performing the multiple linear regression analysis, significant associations were found between the independent variable company size with the factors F8 and F9 of the dependent variable vertical integration. As well as between the independent variables Sales to self-service stores and Direct export sales with the factors F( and F11 of the dependent variable vertical integration.

Table 3

Results of multiple linear regression analysis

| . Dependent Variable | | | | | | |
|---|---|---|---|---|---|---|
| Independent variables | F7 | F8 | F9 | F10 | F11 | F12 |
| Characteristics of the company: | | | | | | |
| Age | .052 | .037 | .000 | .139 | -.044 | .138 |
| Size (number of workers) | -.010 | .295** | .326** | .058 | -.014 | .072 |

| Marketing Channel | | | | | | |
|---|---|---|---|---|---|---|
| Own shops | -.057 | .085 | .110 | -.184 | -.008 | -.173 |
| Catalog Sales | -.011 | -.093 | -.045 | .045 | -.185 | .017 |
| Online sales | .013 | -.092 | -.100 | -.138 | .124 | -.152 |
| Sales to intermediaries Wholesalers | -.088 | -.011 | -.087 | -.107 | .016 | -.094 |
| Sales to intermediaries Retailers | -.030 | .039 | .002 | .078 | -.039 | .064 |
| Sales to stores Departmental | -.003 | -.063 | .025 | .096 | -.041 | .065 |
| Sales to self-service stores | .000 | .296** | -.240 | -.202 | .230* | -.165 |
| Export sales through intermediaries | -.006 | .166 | .162 | .087 | -.150 | .088 |
| Export Sales Direct | .006 | -.100 | -.103 | .011 | -.332** | .101 |
| Other | .000 | -.091 | -.118 | .076 | .138 | -.020 |
| $R$ | .128** | .513** | .476 | .374* | .447* | .369* |
| $R2$ | .016 | .264 | .227 | .140 | .200 | .136 |
| *Adjusted R2* | -.089 | .185 | .144 | .048 | .114 | .043 |

Standardized coefficients are reported. N = 125.
* $p < .05$
** $p < .01$

## Conclusions

The textile industry is characterized by having marketing channels according to the current needs of the market, however, it is necessary to incorporate new market strategies that allow it to achieve competitiveness with greater competitive development. A new division of marketing was found, where, from the division of the phases of the marketing channels and their consequent distribution to developing countries, the new framework of competition at the international level of the textile industry has been consolidating. It was determined that there is a significant relationship between vertical integration and distribution channels as factors of competitiveness.

A marketing channel is the set of people and companies involved in the transfer of rights to a product and its passage from the producer to the consumer or end business users, the channel always includes the producer and the end customer of the product in its present form, as well as intermediaries such as retailers and wholesalers so that the role of distribution within the marketing mix is to get the product to its target market. The most important activity in bringing a product to market is arranging its sale and the transfer of rights of the product to the final customer [14]. The results of the multivariate analysis of vertical integration, show that the marketing channel is through catalog and through department stores, among others.

As we have already mentioned in the course of this research, market strategies are a means to achieve long-term objectives, a strategy is the pattern or plan that integrates the main goals and policies of the organization, establishing the coherent sequence of actions to be taken. The competitive strategies are the determination of the fundamental long-term purposes, objectives, adoption of courses of action and distribution of the necessary resources, of a company to carry out these purposes, as well as to reach its competitiveness, the capacity that a public or private organization has to maintain comparative advantages, and to reach, sustain and improve a position in the socioeconomic environment.

The development of the company through vertical integration, is clear, arises from the competitive advantage based on their production methods and organization and reflected in the price and quality of the final products, these in comparison with the competition. The ability to compete of a company, is sustained by the ability to compete with the same prices and quality of products, when this is equal, it will continue to compete, for these suppliers will remain competitive when you keep the same costs of raw materials of its competitors. On the other hand, companies that manage to establish a reputation for quality, will remain competitive.

The identification of the factors that determine in each company its vertical integration and as a consequence its competitiveness, is through the analysis of its strengths, opportunities, weaknesses and threats, this will allow to know the real and particular situation of the elements that turn to the interior of the organization and that influence so that its company does not manage to be competitive.

The textile and clothing industry requires a competitive strategy of integral development which will be seen, as a consequence of a transformation in the sector, driven by technology, contributing to the generation of new products and sectors. In such a way that technological capacity, such as technical, administrative and organizational skills, which are necessary for companies to establish infrastructure, use it, improve it and eventually develop new products and processes.

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