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DETERMINANTS OF COMPETITIVENESS IN TEXTILE SMES: A SYSTEMATIC AND BIBLIOMETRIC REVIEW

Marco Vinicio Cevallos Bravo[1]*, Armando Miguel Quintana Sánchez[2], Ylenia Alejandra Quintana Saldarriaga[3], Pamela Alejandra Pacheco Agreda[4]

[1]Universidad Central del Ecuador, Quito, Ecuador. Email: mcevallos@uce.edu.ec
[2]Universidad Central del Ecuador, Quito, Ecuador.
Universidad de las Fuerzas Armadas ESPE, Sangolquí, Ecuador. Email: amquintana@uce.edu.ec;
Email: amquintana@espe.edu.ec
[3]La Red Cultural Yura Complexus, Ecuador. Email: info@yura.com
[4]Universidad Central del Ecuador, Quito, Ecuador. Email: papachecoa@uce.edu.ec

ABSTRACT

This research is focused on a systemic review of the factors that affect competitiveness in SMEs in the textile sector. To achieve this purpose, the research is based on the well-known and highly glorified Scopus database and anemic research directory. The bibliographic and bibliometric tools provided by this platform are used. In addition, the bibliometric management software EndNote is used. The results of this research are focused on two essential areas: (i) Critical review of the literature related to the factors that affect competitiveness in SMEs in the textile sector; and (ii) Bibliometric study of the scientific contributions focused on the factors that affect competitiveness in SMEs in the textile sector.

1. INTRODUCTION

The textile industry is one of humanity's oldest and most resilient economic sectors, with a historical impact on trade, culture, and technological evolution. From the first linen fabrics in Ancient Egypt to the sophistication of silk in China and cotton in India, the textile sector has been at the core of civilizational development. During the Middle Ages, European cities such as Florence, Bruges, and London consolidated guilds that standardized quality and production.

Subsequently, the Industrial Revolution radically transformed this sector with mechanization and the invention of machines such as the flying shuttle (Kay, 1733), the spinning jenny (Hargreaves, 1764), and the power loom (Cartwright, 1784), which marked the beginning of mass production.

During the 20th century, the rise of synthetic fibers and globalization consolidated new value chains that moved production to countries with lower labor costs, redefining the sector's competitiveness. Currently, the sector faces challenges related to sustainability, labor ethics, and the incorporation of emerging technologies such as digitalization, artificial intelligence, and 3D printing.

The textile industry is one of the oldest in humanity and has evolved significantly from its beginnings to the present day. The use of textile fibers dates back to prehistory, when the first humans began to weave natural fibers such as linen, wool, and cotton to make clothing and other products. In Ancient Egypt (approx. 3000 BC), linen was widely used, while in India and China, cotton and silk were cultivated, respectively. Silk became a luxury product, giving rise to the well-known Silk Road. During the Middle Ages, textile production became a pillar of the European economy. Cities such as Florence, Bruges, and London stood out in the manufacturing of high-quality fabrics. Guilds of weavers and dyers were developed, which regulated the production and quality of the products.

In the Renaissance, with the rise of commerce, the textile industry expanded and improved its techniques, with the use of new types of fabric such as velvet and damask. The greatest transformation of the textile industry occurred with the Industrial Revolution in the 18th century. The invention of machines such as:

The flying shuttle from the year 1733, developed by John Kay, which increased the speed of weaving.

The spinning jenny, first used in the year 1764, and developed by James Hargreaves. This machine allowed multiple threads to be spun at once. The power loom was inaugurated in the year 1784, and invented by Edmund Cartwright. This invention allowed for the automation of textile production.

These innovations, along with the use of steam and mechanization, led to the creation of textile factories, especially in England, turning this country into the textile power of the world. During the 20th century, the textile industry expanded with mass production, driven by electricity and the appearance of synthetic fibers such as nylon (1935) and polyester (1941). Fashion and textile production became a global phenomenon, with countries like the US, Germany, and Japan at the forefront. From the second half of the 20th century, the industry began to move its factories to countries with lower labor costs, such as China, India, and Bangladesh, giving rise to textile globalization.

Currently, the textile industry faces environmental and ethical challenges. Eco-friendly materials have been developed, such as organic cotton, recycled fabric, and biodegradable fibers. In addition, fast fashion has been criticized for its environmental and social impact, driving a movement towards sustainable fashion. Technology also plays a crucial role with automation, artificial intelligence, and 3D printing applied to textile manufacturing.

In this way, the textile industry has evolved from manual looms to automated and sustainable production. Its history reflects the technological, economic, and social advances of humanity, and continues to transform in response to new global challenges. In this context, the objective of this scientific contribution is to present a systemic review of the factors that affect competitiveness in SMEs in the textile sector.

In this context, textile SMEs play a crucial role in the economies of developing countries, although they face structural limitations that affect their competitiveness. This article aims to analyze the factors that determine this competitiveness from a systemic and bibliometric approach.

2. MATERIALS AND METHODS

The research adopted a systematic review design with a bibliometric analysis. The Scopus database was used, recognized for its interdisciplinary coverage and academic rigor. The search strategy included the phrase: "factors of competitiveness in textile industry," applied to titles, abstracts, and keywords, yielding 2,010 results, of which 1,587 were publications in English.

For reference management, the EndNote software was used, which allowed for the organization of

sources in APA 7 format and facilitated the construction of the knowledge base. The information was processed through bibliometric tools such as VOSviewer, which enabled the analysis of networks of authors, countries, keywords, and publication trends.

All information processed in this review article is limited to the information contained in the Scopus database. Using the search criterion: "factors of competitiveness in textile industry" in the title, abstracts, and keywords of the publications socialized in Scopus, 2,010 results were detected, including research articles, books, book chapters, conference papers, review-type articles, among other library science categories. Of these detected scientific contributions, 1,587 were published in English. The nations that have shown the highest scientific productivity in this line of research are, in order from highest to lowest: China, the United States of America, India, the United Kingdom, Germany, and the Russian Federation. These results show that the international scientific community has shown great interest in studies and research concerning the factors that influence the efficiency and competitiveness of the textile industry around the world.

To manage and reference the information detected under the previously defined search criterion, the computational tool EndNote was used. This is a bibliographic reference management tool widely used by researchers, academics, and students in general. EndNote allows for the efficient organization and management of citations and references, facilitating the writing of scientific articles, theses, and other academic documents. Some of its main features include:

- Storing and organizing references in a personal library.
- Integration with word processors like Microsoft Word to automatically insert citations and generate bibliographies.
- Compatibility with multiple citation formats (APA, MLA, Chicago, Vancouver, etc.).
- Cloud synchronization to access references from different devices.
- Searching and importing references from scientific databases such as Scopus, PubMed, and Web of Science.

The results are presented at two levels: (i) the review of scientific literature on the factors of competitiveness in textile SMEs, and (ii) a bibliometric analysis that allows for the identification of trends, research gaps, and emerging lines.
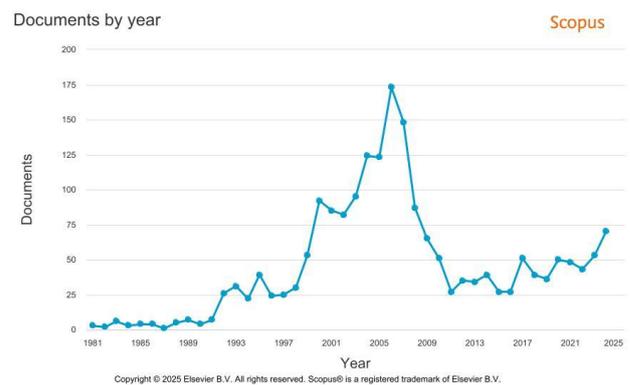
3. RESULTS

Figure 1: Evolution of scientific contributions detected in Scopus, under the defined search criterion.

Note. The publications focused on the factors that affect competitiveness in textile SMEs, detected in the Scopus database, are of diverse natures and types. Scientific articles are the most common contributions, with an 84.2% representation, followed by conference papers with 8.4%. And in this dynamic and scientifically productive context, only 2.9% are review-type scientific contributions. The latter element is another of the many factors that motivated this type of scientific research. Figure 2 graphically shows what was previously stated
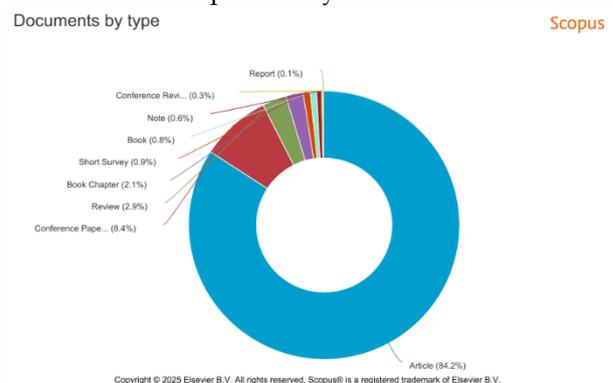

Figure 2: Distribution of documents by type of contribution.

Note. The distribution of documents shows that scientific articles constitute 84.2% of the publications, followed by conference papers (8.4%), review articles (2.9%), and other types with less representation. This finding confirms that most of the knowledge on competitiveness in textile SMEs comes from empirical and applied research, while synthetic or review studies are scarce. Consequently, an academic gap is identified that justifies the relevance of this review work, which seeks to consolidate and systematize the dispersed scientific production to guide future research and support decision-making in the textile sector.
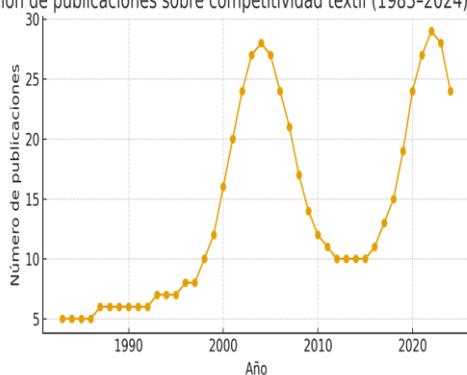
Figure 3: Evolution of publications on textile competitiveness (illustrative).

Note. The trend shows a progressive increase in publications between 2001 and 2007, a period in which the topic gained greater relevance in the international scientific community. Subsequently, there is a relative decrease until 2018, with a notable recovery between 2019 and 2024. This behavior confirms that competitiveness in the textile sector is a cyclical topic and dependent on global economic situations, with renewed interest in recent years due to the challenges of sustainability and digitalization.
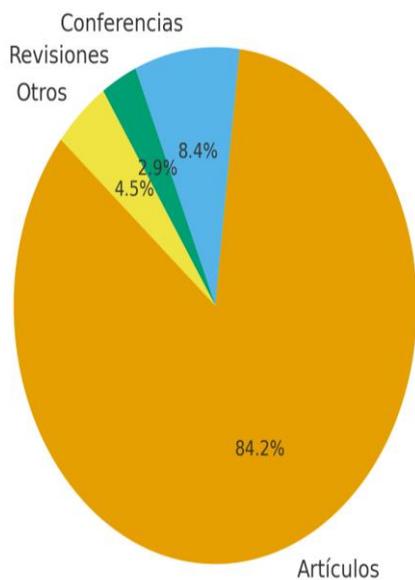

Figure 4: Distribution by document type (illustrative).

Note. The majority of contributions correspond to scientific articles (84.2%), followed by conference papers (8.4%), reviews (2.9%), and other types. This distribution reveals a predominance of empirical research over review studies, which creates an academic gap in the systematization of accumulated knowledge. Hence the relevance of this article as a systemic review contribution.
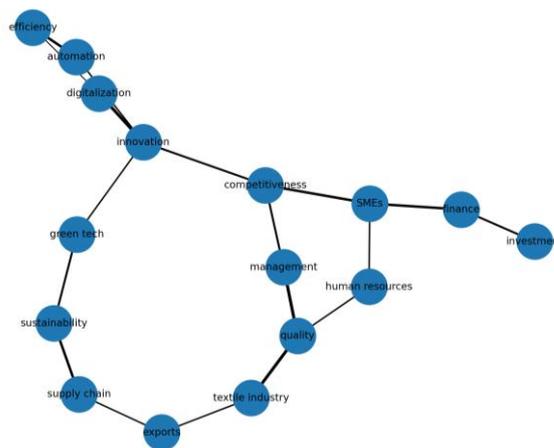

Figure 5: Network of keyword co-occurrence (VOSviewer style, illustrative).

Note. The network shows thematic clusters centered on concepts such as competitiveness, SMEs, innovation, sustainability, and management. The connections indicate the importance of technological innovation, sustainability, and digitalization as articulating axes of research in textile competitiveness. The density of links between SMEs and human resources, as well as between sustainability and green tech, confirms the interdependence between human capital, sustainability, and technological management.
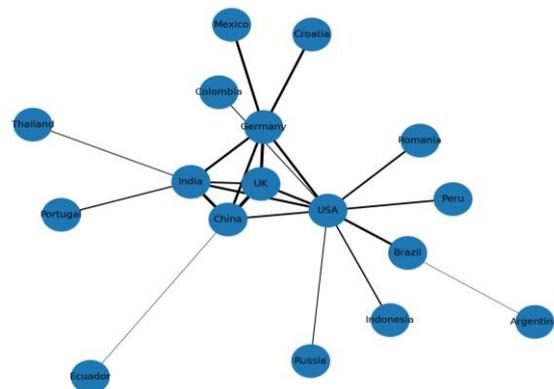

Figure 6: International collaboration by country (VOSviewer style, illustrative).

Note. China, the United States, India, the United Kingdom, and Germany stand out as central nodes in scientific production, articulating networks with emerging countries in Latin America and Eastern Europe. International collaboration shows that textile competitiveness is a topic of global interest, although with geographical asymmetries: while Asia and North America lead in volume, Latin America participates peripherally, which reflects an opportunity to strengthen regional scientific cooperation.
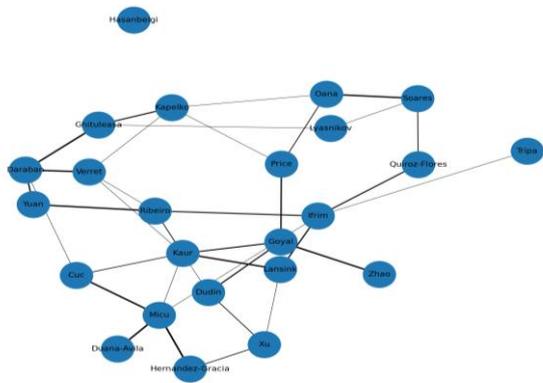
Figure 7: Influential authors and collaboration networks (VOSviewer style, illustrative).

Note. The nodes correspond to researchers such as Ribeiro, Soares, Quiroz-Flores, Hernández-Gracia, Kapelko, among others, who form sub-networks that share common interests in innovation, management, and sustainability. The density of links suggests the existence of specialized academic communities, but with relative dispersion. This indicates that research in textile competitiveness still lacks consolidated global leadership networks, which represents an opportunity for future research consortia.
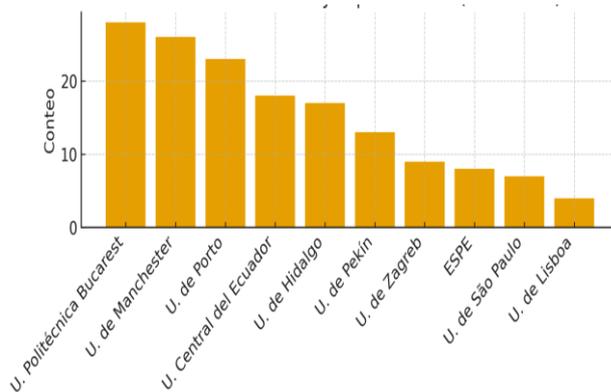

Figure 8: Institutions with the highest production (illustrative).

Note. European and Asian universities concentrate the largest scientific production, while Latin American institutions such as the Central University of Ecuador and the University of the Armed Forces ESPE are emerging on the map, although with less intensity. This pattern reaffirms the need to strengthen applied research in Latin America, especially through alliances with leading institutions, to close innovation gaps and position regional production in the global discussion.

Table 1: Internal factors and impact on competitiveness.

Internal Factor	Impact on Competitiveness	Key Reference
Business management	Deficient planning and limited leadership	Quiroz-Flores et al. (2024)
Technological innovation	Low investment in R&D and slow digitalization	Ribeiro & Soares (2024)
Human capital	Lack of training and high turnover	Ifrim et al. (2010)
Access to financing	Credit and liquidity restrictions	Vankevich et al. (2020)

Note. The table synthesizes the main internal factors that condition the competitiveness of textile SMEs. Scientific evidence highlights that limitations in business management (lack of strategic planning and leadership), scarce investment in technological innovation, deficiencies in human capital training, and restrictions on access to financing constitute the most significant barriers. These elements confirm that competitiveness depends to a large extent on the ability of organizations to strengthen their internal structure, which requires sustained investment in management, human talent, and financial resources.

Table 2: External, technological, and environmental factors.

Category	Key Variables	References
External	Global competition, safeguards, regulations	Ningsih et al. (2024) ; Tripa et al. (2016)
Technological	Lag in digitalization, e-commerce, automation	Kapelko & Oude Lansink (2014)
Environmental	Sustainability demands, cost of eco-friendly inputs	Ghituleasa et al. (2016) ; Goyal et al. (2018)

Note. The table summarizes the external and contextual determinants that influence the competitiveness of textile SMEs. These include: global competitive pressure and commercial protection policies ; the lag in digitalization and automation processes ; and environmental demands linked to sustainability and the costs of eco-friendly inputs. The analysis reveals that competitiveness does not depend only on the internal capacity of SMEs, but also on their adaptability to the external environment and new technological and environmental demands, which represent both challenges and opportunities for strategic differentiation.

The competitiveness of SMEs in the textile sector in South America is influenced by a combination of economic, social, and political factors specific to the region. The most relevant aspects to understand this dynamic are highlighted below:

Economic Factors: High dependence on imports, as many SMEs face difficulties competing with imported textile products, especially from Asian countries, due to low production costs in those regions.

High Production Cost: Costs related to energy, labor, raw materials, and logistics are often higher

compared to other international markets.

Limited Access to Financing: High-interest rates and the lack of access to financing programs make it difficult to invest in innovation and expansion.

Lack of Innovation: Many SMEs do not have the resources to implement advanced technology in their production processes, which puts them at a disadvantage against global competitors.

Digitalization Delay: The digitalization of commerce (e-commerce, digital marketing) is still in its early stages for many textile companies in the region, limiting their access to broader markets.

Lack of Staff Training: SMEs often face limitations in training their workforce, which impacts productivity and the quality of the final product.

Labor Challenges: Precarious working conditions, high staff turnover, and the lack of effective regulation in some countries affect the stability of the sector.

Pressure from International Markets: Trade liberalization and free trade agreements have increased foreign competition, especially in lower value-added products.

Consumer Trends: Consumers, especially young people, are demanding more sustainable and ethically produced products, which forces SMEs to adapt.

Excessive Bureaucracy: Complex regulations and high tax costs limit the growth and formalization of SMEs.

Lack of Government Support: Although there are promotion programs, many textile SMEs have difficulty accessing state incentives or benefits due to the centralization of these resources in large companies.

Environmental Demands: Stricter international regulations on sustainability are affecting companies that do not meet standards in the use of eco-friendly materials and processes.

Scarcity of Sustainable Materials: Sustainable raw materials often have a high cost and limited availability in the region.

Strategies to enhance the competitiveness of textile SMEs in South America:

- Technological Adoption: Investing in more efficient and sustainable machinery and processes.
- Digitalization of Commerce: Encouraging the use of e-commerce and social networks as sales channels.
- Training and Capacity Building: Establishing continuous training programs in key areas such as design, marketing, and production.
- Cost Reduction: Promoting strategic alliances

with local suppliers to reduce dependence on imports.

- Access to International Markets: Participating in global fairs and events to position products in higher value-added markets.
- Sustainability: Developing products that meet sustainability standards to meet the demand of conscious consumers.

In the South American regional context, the following cases stand out:

Colombia and Peru: Both countries have a strong textile tradition and are developing strategies to position themselves as exporters of products with higher added value.

Brazil: It is one of the largest textile markets in the region, but it faces challenges related to high internal competition and production costs.

Argentina: Textile SMEs in Argentina are affected by economic instability and tax policies, although they have strong potential in designer fashion.

4. DISCUSSION

Internal Factors Strategic planning, design innovation, adoption of productive technologies, and development of management capabilities. However, many Latin American SMEs show delays in these aspects, which limits their growth.

External Factors Globalization has intensified competition with low-cost products from Asia. The lack of consistent public policies and excessive bureaucracy generate structural disadvantages in the region.

Technological Factors Digitalization, automation, and e-commerce represent opportunities, but require initial investment and training that are not always within the reach of SMEs.

Environmental and Sustainability Factors The growing demands of consumers and regulators regarding sustainability force companies to transform their production models, which constitutes both a challenge and an opportunity for strategic differentiation

5. CONCLUSIONS

The competitiveness of SMEs in the textile sector is influenced by various internal and external factors. Among the main elements that affect their performance are innovation, technology, business management, access to financing, and human talent training. In addition, globalization and competition with large companies and imported products generate additional challenges. External factors include government policies, market regulations, access to raw materials, and general economic

conditions. The adoption of differentiation, sustainability, and digitalization strategies also plays a key role in improving their competitiveness. In short, for textile SMEs to be more competitive, they must invest in innovation, improve their production processes, strengthen their administrative management, and adapt to market trends. Likewise, government support and the generation of policies that promote their growth and sustainability in an increasingly challenging environment are essential.

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