

Bussiness internacionalization according innovation strategies: Tecnoglass case

La internacionalización empresarial desde la estrategia de innovación: caso Tecnoglass

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Abstract

Introduction: In Colombia, business internationalization has been a slow process given the marked economic primarization. In 1991, the government tried to implement the Economic Opening program, a moment in which the national economy tried, based on the International Trade Agreements signed by the government, to insert itself into the New International Economic Order. However, Tecnoglass managed to penetrate the international market through a strong innovation strategy applied to glass manufacturing. **Objective:** Analyze the business internationalization process in the country based on the case of Tecnoglass, a Colombian company located in Barranquilla. The above based on his innovations and the entrepreneurial spirit characteristic of the Arab immigrant from the Caribbean Coast. **Methodology:** The starting point is the study of the Economic Opening policies, implemented in Colombia since 1991, and other works are selected regarding the company's participation in international markets under a mixed research approach. **Results:** It is concluded that the success of its internationalization strategy is essentially focused on innovation. **Conclusions:** The success of Tecnoglass does not lie in the prerogatives or benefits of the FTA signed with the United States.

Keywords: *Tecnoglass, business internationalization, economic openness, competitive advantage, innovation, Colombian Caribbean.*

Resumen

Introducción: En Colombia, la internacionalización empresarial ha sido un proceso lento dada la marcada primarización económica. En 1991, el Gobierno intenta implementar el programa de apertura económica, momento en el que la economía nacional intenta, a partir de los acuerdos de comercio internacional suscritos por el Gobierno, insertarse en el Nuevo Orden Económico Internacional (NOEI). No obstante, Tecnoglass logró penetrar en el mercado internacional a partir de una férrea estrategia de innovación aplicada a la fabricación del vidrio. **Objetivo:** Analizar el proceso de internacionalización empresarial en el país a partir del caso de Tecnoglass, empresa colombiana ubicada en Barranquilla. Lo anterior basado en sus innovaciones y el espíritu emprendedor característico del inmigrante árabe de la Costa Caribe. **Metodología:** Se parte del estudio de las políticas de apertura económica implementadas en Colombia desde 1991 y se seleccionan otros trabajos respecto de la participación de la compañía en los mercados internacionales bajo un enfoque mixto de investigación. **Resultados:** Se concluye que el éxito en su estrategia de internacionalización está centrado esencialmente en la innovación. **Conclusiones:** El éxito de Tecnoglass no reside en las prerrogativas o beneficios del Tratado de Libre Comercio (TLC) suscrito con los Estados Unidos.

Palabras clave: *Tecnoglass, internacionalización empresarial, apertura económica, ventaja competitiva, innovación, Caribe colombiano.*



Introduction

The policy of economic openness introduced at the end of the 20th century in Colombia was the ideal challenge to put an end to the damage caused by economic protectionism, which, according to the international economic policy executing agencies, was the cause of the high economic backwardness of many countries in the Latin American region. The guidelines for the implementation of the economic openness policy were set out in Conpes Document 2494 of 1990, which included the creation of the Ministry of Foreign Trade, whose first minister was former President Juan Manuel Santos, and an agency to stimulate the export of goods and services of SMEs: Proexport, which since 2011 has been known as Pro-Colombia.

In order to achieve the internationalization and modernization of its economy, Colombia had already been part of the Kemmerer missions, led by U.S. economist Edwin Walter Kemmerer in 1920. The purpose of this program was to ensure the economic development of Latin American countries in the face of high levels of extreme poverty, aggravated, to a large extent, by the Great Depression.

In line with this model, the central government sought to implement strategies aimed at decentralizing the State's means of production in order to achieve greater economic prosperity and, consequently, an increase in the gross domestic product (GDP) and the human development index (HDI).

Gómez Celi (2021) points out that "the influence of financial institutions such as the World Bank, the International Monetary Fund and the Inter-American Development Bank [...] played a preponderant role in the adoption of the decentralization of the country and the reconfiguration of the Colombian economy" (p. 301). This, together with the growing boom of the globalization model, in all its manifestations (economic, political, technological and cultural), constituted a challenge for the enterprises that wished to be in tune with the New International Economic Order (NIEO) of capitalist market economy.

However, the particularities of the national economic system made it problematic for Colombia to fully adapt to the new market economy landscape. Among these we can highlight the still latent historical and structural inequality of the country, which brought with it criticisms regarding the purely neoliberal approach of the policy of economic liberalization. From this arises the task of adapting this process to the structural or particular conditions of Colombia and other Latin American countries, which have led to dynamics that undermine foreign investment or the country's openness to international markets, such as drug trafficking, institutional corruption and low levels of schooling. Sunkel and Zuleta (1990) point out how, due to the impossibility of adapting the Anglo-Saxon neo-liberal model of economic openness, a neo-structural approach emerged within the Economic Commission for Latin America and the Caribbean (ECLAC), which allows for the modernization of the economy without neglecting the aforementioned problems.

According to the above, this process was not free of difficulties and potholes, since initiatives such as:

Law 60 of 1993 consolidated in the country the internal competition among the different territorial entities for the resources transferred from the Current Revenues of the Nation according to the specific and eventual need in order to generate a system of efficiency and effectiveness in the allocation of resources, which led to a dispute among different territorial entities for the decimated resources and the constant relationship of corruption that permeated the fiscal allocations. (Gómez Celi 2021, p. 310).

In line with the above, few companies in various sectors, such as the energy and textile industries, among others, were able to take advantage of this new macroeconomic reality. Likewise, this panorama became the breeding ground to begin the approach regarding the need to carry out business internationalization processes, which we can understand as the determination of a conglomerate to export its offer of goods or services to other markets.

Theoretical framework

Various authors such as Buckley (1985) and Porter (1985) point out in their research how locational causal factors play an essential role in the processes of business internationalization. Consequently, in the case of Colombia, the conglomerates that have been most favored by internationalization processes are those located in coastal areas (Caribbean and Pacific coasts). Ibarra Consuegra et al. (2021) state that in the case of Barranquilla, the privileged location of the city, surrounded by the sea and river, together with the immigrant- origin entrepreneurship, as well as trade in public markets, were decisive factors for the city to become a center of industrial and port development in Colombia.

This is supported by the fact that cities such as Barranquilla have achieved, long before the implementation of the internationalization processes resulting from the implementation of the policy of economic liberalization, the consolidation of foreign capital companies, also favored by the strong presence of immigrants from different latitudes (Arabs, Jews, among others).

Viloria de la Hoz (2003) points out how the entrepreneurial spirit of Arab immigration in coastal and riverside cities, together with their high social and economic capital, led to the gestation of successful ventures that did not skimp on the implementation of essential elements for business innovation processes from a multidimensional perspective. But the entrepreneurial innovation initiatives associated with immigrants are not only limited to the diaspora of Arab origin. A clear example of this is the Lemaitre family, Cartagena natives of French descent, who were pioneers in the manufacture of cosmetic soap at the national level.

According to the above, this article raises the following questions: what innovation strategies can be used in the

What are the factors that explain the exceptional nature of Tecnoglass' successful internationalization in the U.S. market? And how does the fact that it is a family business made up of individuals of immigrant origin influence its exponential growth?

Methodology

This is an explanatory and applied research under a mixed approach, in which, from the conjugation of analysis and use of qualitative and quantitative data of the economic openness policies and the macroeconomic indicators of Tecnoglass, a correlational-causal design was established making use of tools from primary sources (macroeconomic statistics, among other indicators) and secondary sources (other works referring to the processes of innovation and business internationalization with a focus on the immigrant entrepreneurship of Arab origin), as well as of the economic openness policies in Colombia, among other indicators) and secondary sources (other works referring to the processes of innovation and business internationalization with focus on the immigrant entrepreneurship of Arab origin), as well as the policies of economic openness in Colombia.

Results

Business innovation, competitive advantage and economic growth

In the context of business development, it is well known that, in the increasingly competitive market for goods and services, innovation has become a fundamental axis for the economic growth of companies.

Although the word innovation is a relatively new term in the field of economic and business studies, it has been used by classical economists for many years. Authors such as Adam Smith, David Ricardo and even Karl Marx called invention everything new that was conceived within companies or by masterminds to generate resources that leverage economic growth and optimize the production processes of high-demand goods.

Likewise, these authors identified the advantages and disadvantages of the processes of the then called invention, such as inequality in the concentration of wealth, unemployment resulting from the technification of industrial processes and the monopolization of a country's means of production by small business groups or conglomerates.

However, since the arrival of the policy of economic openness, implemented since the arrival of a new century more than twenty years ago, and the processes of globalization, innovation itself has become increasingly necessary as the axis of economic growth.

Schumpeter (1983) summarizes the innovation processes using the following variables:

Y: gross domestic product

L: labor force

N: resources

K: capital stock T:

technology

Among the above components, GDP, understood as the conglomerate of goods and services produced within a country, depends mainly on labor (L), various resources (N) and technology (T) as a guarantor or ally for business innovation in the consecution of a high capital stock (K).

However, from a contemporary point of view, the implementation of the research duo + development has become increasingly indispensable in the innovative processes within organizations. Albis Salas et al. (2014) point out that innovation capacity at the organizational level depends on factors such as high competitiveness in different market sectors, company size, geographic proximity, export intensity and, above all, human capital.

Other factors to consider are of an exogenous nature, such as the socio-political situation of a country and the use of free trade agreements (FTAs) and the international trade agreements that emanate from them. No less important is the quality of the working environment provided by the entrepreneur and his ability to adapt to the context in which he carries out his economic or business activity.

Regarding the last point, Tecnoglass, through various community and urban investment initiatives, as well as in its corporate or organizational development policies, has managed to attract a large amount of support from the national business community and governmental entities. A significant example of this is the Tecnoglass Foundation, which has advanced various projects aimed at social intervention in the community of Las Flores neighborhood, where the factory and administrative offices of the company are located.

Porter (1985) points out that competitive advantage is the ability of a company to produce or generate goods or services that have an added value compared to its competitors in the same segment. Within the framework of the above, Tecnoglass, based on its innovations in the processing of its main raw material: glass, has managed to surpass its opponents in the domestic market.

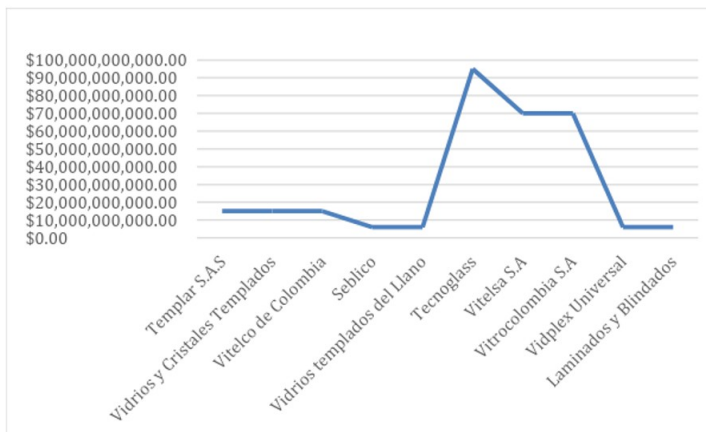
Table 1 illustrates the above from the point of view of the range of utilities.

Table 1*Tecnoglass earnings range and sector competitors (2021)*

Company	Earnings range (in pesos)
Templar	15.000.000.000,00
Tempered Glass and Glazing	15.000.000.000,00
Vitelco of Colombia	15.000.000.000,00
Sebluco	6.000.000.000,00
Llano tempered glass	6.000.000.000,00
Tecnoglass	95.000.000.000,00
Vitelsa	70.000.000.000,00
Vitrocolombia	70.000.000.000,00
Vidplex Universal	6.000.000.000,00
Laminated and Armored	6.000.000.000,00

Note: It is estimated that in the fenestration subsector Tecnoglass captures 51 % of this market according to Tecnoglass (2017).

Source: Own elaboration based on Informa (n. d.).

Figura 1*Rango de utilidades de Tecnoglass y competidores del sector*

Nota: Los valores establecidos son estimados.

Fuente: Elaboración propia con base en Informa (s. f.).

Note that in terms of national profits, the only competitor that equals Tecnoglass is the Bucaramanga-based company Vitelsa.

Discussion

Immigrant entrepreneurial dimensions: key to business success

Like many other families of immigrant origin, especially Arab, the Daes family has managed to take advantage of the advantages offered by the Colombian Caribbean, especially the strategic location of Barranquilla as the main port and commercial city in the region, to commercialize their enterprises, not without first relying on the so-called solidarity networks among the members of the colony settled on the northern coast of Colombia.

Igirio Gamero (2008) frames the values of entrepreneurship with the characteristics of the traders and businessmen of the Arab and Jewish colony of the Caribbean Coast. Some of them are:

- Desire for improvement and progress
- Ability to identify opportunities
- Leadership
- Vital force

Undoubtedly, in the business history of Tecnoglass we can identify each of these traits, given that, as commented by its chief executive officer (CEO) Christian Daes y Semana ("Tecnoglass: Made in Colombia", 2018):

Before the Tecnoglass Group was positioned as a leader in the glass industry, Christian Daes, president of the company, had already failed several times in the attempt to create empresa. He started selling solar heaters in Barranquilla, but soon went bankrupt due to the boom that had the arrival of natural gas in the eighties. However, he says that you have to set up 20 businesses for one to work, and after thinking for several days on how to save the investment, he had the idea of manufacturing windows with glass and aluminum that already produced.

This led to the creation of Tecnoglass in 1994, a company initially dedicated to the processing and manufacture of tempered glass, to later venture into the manufacture of aluminum, glass and windows with its Allutions line, created in 2007.

Entry into Panama and the United States: a platform for leveraging competitive advantage and market diversification

It is well known that competitive advantage is key to efficiently penetrate the different international markets. Tecnoglass, with its arrival in the United States and Panama, was able to clearly identify its market diversification opportunities, which arose from the first failures of the Daes family from the moment they decided to take the path of entrepreneurship.

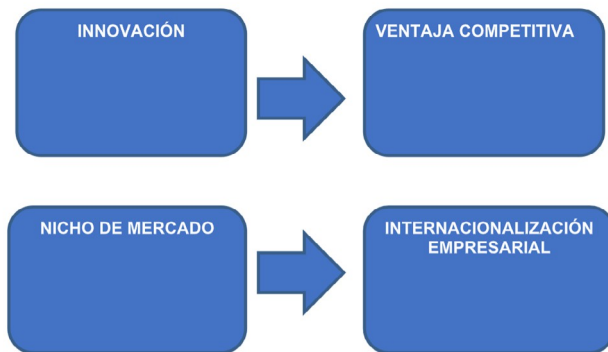
As part of its internationalization process, Miami (Florida) has become one of the most important

the most attractive cities for the Barranquilla conglomerate, since the constant hurricane seasons allowed Tecnoglass to create one of its star products: anti-hurricane glass (laminated glass), which "can withstand the force of a category 5 cyclone, with winds of more than 250 km per hour, or the impact of objects thrown by it. The film holds the cracked glass together, preventing the wind from entering the house during a natural disaster" ("Tecnoglass hurricane glass is produced from Colombia", 2022). This innovation contributed to fill a market niche not previously occupied by any other national and foreign company competing in the same sector.

This is how we can schematize the Tecnoglass business innovation process from Figure 2.

Figura 2

Proceso de innovación empresarial de Tecnoglass



Nota: Nótese que parte de la innovación como eje de su consecuente internacionalización.
Fuente: Elaboración propia.

It is important to emphasize that the innovation process must lead to the identification of a market niche. Works such as the research carried out by Silva Villavicencio (2023) demonstrate the indispensability of identifying and consequently searching for a potential market in which the need for consumption of the innovative good or service is manifested as a strategic element to enhance the financial and commercial positioning of a company or business conglomerate, accompanied by a timely digital marketing strategy.

From the case of Tecnoglass' business innovation, it is feasible to determine preliminarily that the company's innovation process arises from the search for elements that allow putting into practice the concept of competitive advantage, very much in line with what Porter (1985) outlined.

This competitive advantage has enabled the company to find a good market niche and, consequently, to achieve its internationalization process in markets of the world's most dynamic and dynamic economies.

very attractive countries for national entrepreneurship, such as Panama and the United States. Regarding the latter, with the sale and marketing of laminated glass in Florida, a state characterized by constant hurricanes that affect different cities, especially in the south, and with the creation and implementation of the sale of Low-e glass.

This is how business innovation, together with the strong entrepreneurial spirit of Tecnoglass' management team, facilitated the company's insertion process in these international markets long before Colombia signed FTAs with these markets and even before the aforementioned economic opening process was implemented.

FTA with the United States: consolidator of business internationalization

Thanks to the above, as far as Tecnoglass is concerned, the FTA with the United States was an ally or potentiator, but not a determining factor in the process of internationalization of the company, since, as already mentioned, by the year of the implementation of this trade agreement with the North American country (May 2012), the company was already exporting a significant amount of its products to this market, since its arrival in the U.S. market, as well as in Panama, materialized in 1996. The company was already exporting a significant amount of its products to this market, since its arrival in the North American market, as well as in Panama, took place in 1996, a date for which the FTA was still under study, largely due to the country's socio-political situation.

According to official company figures, five years after the signing of the FTA with the United States, 76 % of sales were directed to this country (Tecnoglass, 2017), with a high concentration of product demand in Miami, which had already put on the table the need to open offices in South Florida.

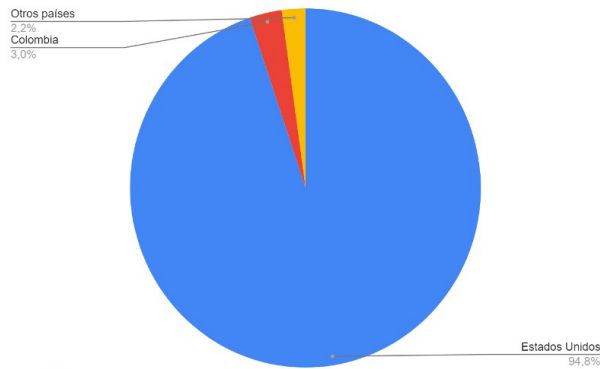
However, the company's previous positioning in the Anglo-American market, in addition to the boost given by the FTA signed with the United States in 2011, was the breeding ground for the company to become the first in the history of Colombia in the National Association of Securities Dealers Automatic Quotation System (Nasdaq), whose share in 2021 rose 3.9% after its second ringing (Asmar Soto, 2021).

No less important, the company has launched a process of infrastructure expansion, all with the purpose of responding to the high demand of its clients, especially foreigners. This has led to the hiring of new employees (workforce) thanks to the resources from its dividends, which meant that by 2022 its income was US\$201.8 million, with exports mainly to the United States valued at US\$604.371 million. This represented a percentage increase of 53% over the previous year and the possibility of an increase in operating costs as a result of the opening of new offices in Miami.

Figure 3 demonstrates the preponderance of the U.S. market for the company group based on its percentage share of its main markets from a sales standpoint.

Figura 3

Ventas de Tecnoglass (2022)



Nota: Comparativa entre ventas locales e internacionales con base en valores expresados en millones de dólares.

Fuente: Elaboración propia.

The process of expanding the company's logistical and operational capacity has also been accompanied by the following innovation initiatives (Table 2).

Table 2

Tecnoglass' innovation initiatives applied to its logistics and operational capabilities

Photovoltaic energy	Applied in its entirety to its production plants, this reduces CO2 emissions, lowers production costs and mitigates environmental damage.
Low-e glass	Manufacture of glass adaptable to different temperatures in accordance with the legal provisions of the European countries that have signed up to the Paris Agreement, including Colombia, which, in 2016, subscribed to the initiative.
Sputtering plant assisted spraying plant	Plant that processes nanometer-thick layers of glass, which is the input for the manufacture of hard disks and microchips.

Note: Each innovation addresses the potentiation of competitive advantage.

Source: Own elaboration based on Tecnoglass (2017).

Social responsibility: axis of local positioning

While it is well known that Tecnoglass' business success based on its commercial innovations is largely due to its successful incursion into the United States, the company has been able, through a latent philanthropic presence in Barranquilla, its city of origin, to cover its corporate social responsibility (CSR) mission.

Companies, in response to the Sustainable Development Goals (SDGs) outlined by the United Nations, together with the recent legal provisions of the National Government concerning different aspects of the interdisciplinary development of their workforce, see an increasingly urgent need to incorporate CSR as an axis of organizational development.

According to the above, Tecnoglass, through the Tecnoglass Foundation and consequent social objects, has advanced several transformational initiatives, among which are the scholarship program for low-income youths and the support to the San Pablo School, located in the La Paz neighborhood in Barranquilla. No less important is the support given to urban development or growth processes in the Las Flores neighborhood, adjacent to the location of the company's operational and administrative headquarters. These projects have materialized since 2005, when the Tecnoglass Foundation was legally constituted.

It is worth noting that the various initiatives that the company, through its CSR roadmap, has managed to advance, contribute to the positioning of Barranquilla as an attractive city in terms of tourism. A clear example of this is the donation of the Window to the World Monument. From the economic and commercial point of view, these initiatives are value-added strategies in the business (Bernal López and Alpuche de la Cruz, 2023), which some large organizations incorporate in order to position themselves locally as a tool to approach other sectors such as the public and increase their reputational image indicators measured from their communications or public relations departments. Likewise, in local economic history, this has its support and correlation in the applicability of the so-called solidarity networks, a term coined to name the different public-private alliances that are developed within the Colombian business community belonging to the Arab diaspora, which is not an isolated case in the Colombian Caribbean, since it has also been seen in other Latin American countries with a strong immigrant presence such as Mexico where nepotism penetrates business relations (Ramírez Carrillo, 2018).

Conclusions

Tecnoglass' internationalization strategy is essentially based on innovation. This is supported by its market diversification processes and state-of-the-art technologies that have allowed it to introduce products with high added value, such as hurricane-resistant glass, a recurring natural phenomenon in the United States, especially in cities in southern Florida.

Likewise, its case constitutes a clear example of the exploitation of the processes of globalization of the economy by creating a company from a geographic area historically vital for Colombia, which, given its port location, facilitates the processes of logistical interconnection with international markets. Meisel Roca (1989) explains how the geographical location of Barranquilla led to the birth of a prosperous industrial manufacturing zone, which until the mid-nineteenth century was the most important in the country. As mentioned, "Barranquilla was the Colombian city with the highest demographic growth and had a very dynamic economy. It was the main Colombian port, the third city in the country in population and its per capita income was one of the highest in Colombia" (Meisel-Roca, 2008, p. 1).

Finally, it is important to underline that its business success story makes it possible to specify that

The success of a company should not depend solely on the macroeconomic situation of a country, but also on the entrepreneurial spirit of the owners of the organization, typical of Arab immigrants who settled on the Colombian Caribbean Coast. In line with the above, the FTA with the United States was not a decisive factor in the company's business internationalization process, but rather a consolidator or enhancer of its strong commercial presence in the North American country, given that the company had already begun its operations in this country some time before the signing of the trade agreement in question by relying on innovation initiatives as a fundamental axis for penetrating international markets, especially the United States and Panama.

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