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**Logistics as a Competitiveness
Factor for Small and Medium
Enterprises in Latin America and the
Caribbean**

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Abstract

International trade has experienced substantial changes in the past decade. The opening of world markets, as reflected in the reduction of tariffs and the elimination of non-tariff barriers in the 1990s, has given rise to remarkable changes in trade activities. Nowadays, it is common practice for companies to source, manufacture, and market their products beyond their own country's borders.

The logistics industry is one of utmost relevance and principally serves as a motor of private sector development and growth of the economic sectors of a country or region. A logistics industry that is efficient and accessible to everyone is a key element for companies in a country or region in general, and its small- and medium-sized enterprises (SMEs) in particular, to successfully compete in this new global context.

Despite improvements in Latin America and the Caribbean (LAC) in recent years, structural logistics problems persist, creating obstacles to exports for firms in the region, particularly SMEs. This paper emphasizes the main challenges faced by the logistics industry and proposes interventions to address these challenges. Moreover, on the basis of case studies the region, the paper analyzes what measures can be taken by SMEs to improve their logistics capacity, thereby improving their export potential.

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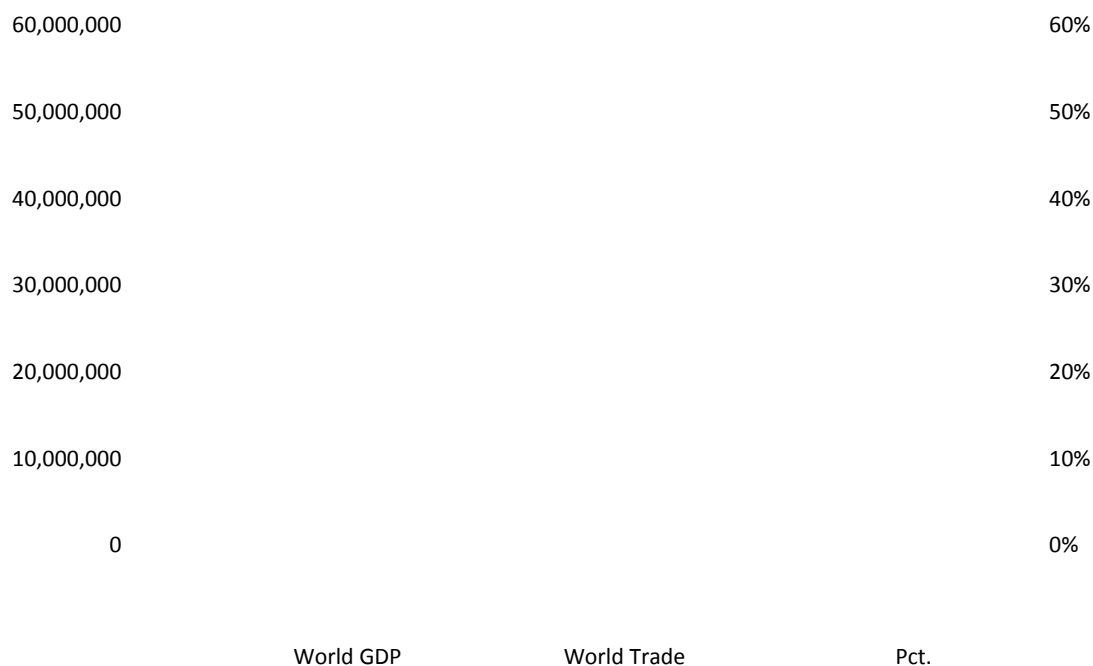
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Introduction: Changes in Trade and Logistics Activities

International trade has experienced substantial changes in the past decade. The opening of world markets, as reflected in the reduction of tariffs and the elimination of non-tariff barriers in the 1990s, has given rise to remarkable changes in trade activities. This opening of the world markets, and the resulting globalization of supply chains, has required a set of structural changes that the logistics industry has had to respond to.

Currently, the world's major economies are ever more open to trade. Thus, expressed in constant U.S. dollars, world trade grew 6.0 percent annually between 1971 and 2010 (doubling every 12 years), while GDP grew 3.4 percent annually (doubling every 20 years). As a consequence, world trade as a percentage of GDP rose from 20 percent in 1971 to 51 percent in 2010.¹

Figure 1. World Trade as a Percentage of GDP



Source: World Trade Organization (WTO). Statistics Database, consulted in 2011.

Such an evolution of world trade and global competitiveness has given rise to high and complex demands for logistics services.

As currently understood, logistics is a broad concept defined as “that part of the supply chain management that plans, implements, and controls the efficient and effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer’s requirements.”²This definition includes terms such as “service” and

“information” that go beyond the simple transportation of goods. Nowadays, supply chain management (SCM) is a fundamental element of a company’s performance, particularly companies with a significant export business.

Within this context, it is important to become familiar with some of the key factors affecting the development of logistics. In the next pages we define these factors in detail and explain their importance within the context of increased global trade.

Global Sourcing

Global sourcing is the practice of sourcing goods and services across national boundaries in what has become a global market. It refers to the ultimate goal of exploiting global efficiencies, which may have their origin in low-cost labor or raw materials, but also in other factors such as tax breaks or low tariffs. This trend must be taken into consideration by any SME wanting to take the next step toward growth and develop activities in the global trading arena.

Despite the solid and continued growth of global sourcing, companies still face challenges when it comes to some of the essential aspects of sourcing. For example, tangible costs include increased expenses for customs, storage (higher inventory to account for the remoteness of a supplier/production hub), and transportation. Other costs are not as evident, such as those associated with non-compliance with delivery dates or possible cutbacks in product quality.

However, in the last five years, there has been a sustained increase in acquisitions of goods and services from global suppliers or of manufacturing in far-off production hubs. The cost of resources has been a determining factor in choosing global sourcing. In fact, in certain industries, global sourcing is so common that it is no longer a competitive advantage and has become a prerequisite to competing in the market.

Third Party and Fourth Party Logistics Services (3PL/ 4PL)

The Council of Supply Chain Management Professionals (CSCMP) defines a **3PL provider** as “a firm which provides multiple logistics services for use by customers. Preferably, these services are integrated, or ‘bundled’ together by the provider. These firms facilitate the movement of parts and materials from suppliers to manufacturers, and finished products from manufacturers to distributors and retailers. Among the services which they provide are transportation, warehousing, cross-docking, inventory management, packaging, and freight forwarding.”² Among these services, the three areas most outsourced by client companies are transportation (maritime, air, or land), warehousing, and inventory management. One step ahead of 3PL services are **4PL services**, which provide a higher level of outsourcing of the supply chain, since the provider manages the optimization of a logistics chain, which includes suppliers, clients, and even clients of clients.

The total or partial outsourcing of a company’s logistic activities through a 3PL or 4PL service allows the company to concentrate on its core business, which is equally a source for savings in this area (given its business volumes, the external provider captures larger synergies and can offer highly competitive ser-

vice fees). A successful relationship with a 3PL or 4PL service provider is a result of viewing this provider as an extension of one's own business. This type of service allows an SME to initiate a process of international expansion without the need to overstaff its export activities.

Cold Supply Chain Management

Many products need to be kept at specific temperatures to be properly preserved, including perishable food products and most pharmaceutical products.

Proper management of a cold chain is critical to guarantee the competitiveness of a manufacturing company in international markets. This is especially relevant for SMEs that are trying to develop a new market. Those products that are properly preserved have a longer life span and are considered higher quality. As a result, they receive better acceptance in developed countries, which facilitates their access to the market and allows them to be sold at a higher price per unit. For this reason, expenditures assigned to the proper preservation of perishable food items throughout the cold supply chain must be considered an investment rather than an expense.

The high cost of refrigeration facilities limits the possibility of SMEs having their own infrastructure and is the reason why it is common to use third party facilities and vehicles to handle products that need to be maintained at controlled temperatures.

Transportation Safety

In this scenario where logistics has gained importance as a propelling force of world trade, the safety of merchandise during transportation is a core element for its consolidation. On the one hand, the rise of cross border threats and unlawful activities has introduced an element of risk to international transactions. On the other hand, the liberalization of trade demands the fast shipment of orders and controlled transaction costs.

In response to this control versus facilitation dichotomy, the World Customs Organization (WCO) has developed the SAFE Framework of Standards, which intends to ensure and facilitate world trade through the establishment of principles and standards that have to be transferred by member countries to their respective legal systems. The goal is to take the measures needed to secure the integrity of freight throughout the supply chain against threats such as theft, piracy, and terrorism without hindering global trade. In this sense, regular activities include the accreditation of all those actors participating in the supply chain, the monitoring of cargo shipments, the notification of customs of the contents of cargo prior to its arrival in a country of destination, and the use of seals to prevent tampering between inspections.

SMEs that plan to initiate export trade must take these requirements into account when making international shipments. In this sense, having the support of a 3PL or 4PL service provider externalizes the difficulties that go hand in hand with the mentioned requirements. Furthermore, given the extensive experience of 3PL and 4PL service providers in logistics, management tends to be more effective.

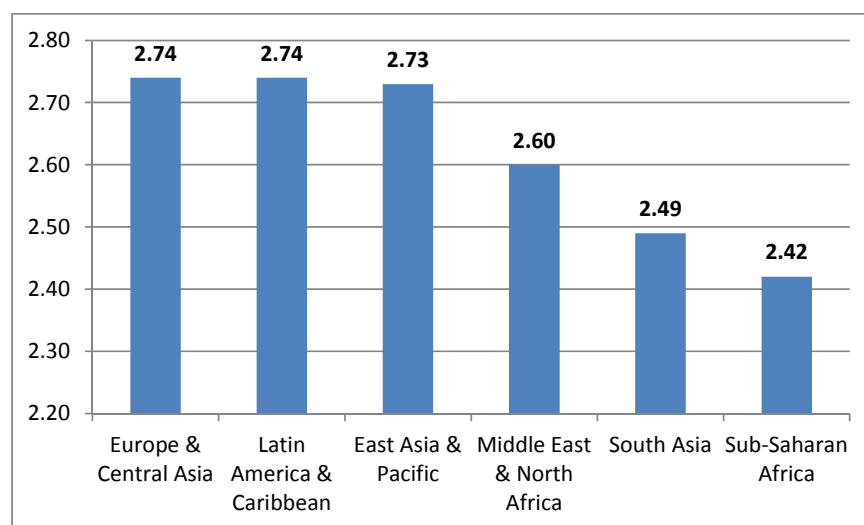
Competitive Positioning in Logistics in LAC

In this section we reflect on factors that influence the logistics competitiveness of companies in LAC.³ Our objective is to identify gaps in comparison to regions considered benchmarks in logistics services that can then be resolved. Additionally, similarities and differences with other emerging regions in the world are identified.

A country or region's logistics efficiency is directly determined by the levels of development of its infrastructure but also by its standards and regulations framework and the quality and accessibility of its logistics services. The Logistics Performance Index (LPI) is an indicator⁴ that was developed by the World Bank to assess the level of logistics development of a given country or region based on the evaluation of concepts such as the efficiency of the customs clearance process, the quality of transport offerings, the volume of logistics infrastructures, the ease and accessibility of hiring transportation, the quality of logistics services, the ability to track and trace shipments (traceability), and the timeliness of shipments reaching their destinations.

In Latin America and the Caribbean, a positive evolution has been recorded for the LPI score, which went from 2.50 in 2007 to 2.74 in 2010. This places the region in a similar position to that of Central Asia and Eastern Europe (2.74) or East Asia and the Pacific (2.73), clearly surpassing other emerging regions in the world.

Figure 2. Global 2010 LPI Scores for Major Emerging Regions



Source: The World Bank 2011. Trading Across Borders report.

However, there still exists a major gap compared to those regions considered benchmarks in logistics (3.87 in the United States and Canada; 3.80 in the European Union in 2010).

Logistics Infrastructure

According to the qualified opinion of industry professionals,⁵ the logistics infrastructure in LAC is no more of a constraint to the development of foreign trade than it is for other emerging regions. The quantitative data support this conclusion, since the logistics infrastructures of LAC countries have been assessed as being superior to those of other emerging regions. In fact, a regional LPI score for infrastructure of 2.46 places the region in a position that is very close to the average for mid-to-high-level income countries (2.54).

Noteworthy, however, is the cold chain infrastructure. As mentioned earlier, the development of refrigeration facilities is costly, thereby making the utilization of third party facilities and vehicles common when it comes to handling products that require controlled temperatures. The availability of these types of facilities and vehicles is very limited in the region, which restricts exports of perishable food goods to value-added markets such as the European Union, the United States, and Canada. The development of advanced logistics services in the region, including those providing adequate cold chain management, would improve the perceived and real quality of perishable goods exported from the region.

Trade Facilitation

Public administration plays an important role in facilitating trade relationships by establishing the conditions required to promote commercial exchange beyond national borders. This is a critical factor that has a great influence on trade. In fact, the costs and time involved in government agency processes may cancel out any potential benefits of large infrastructure investments.

In Latin America and the Caribbean, the diverse trade facilitation processes show levels that are considerably lower than those of developed countries. An export transaction requires 52 percent more documentation than Organisation for Economic Cooperation and Development (OECD) countries, 111 percent more time, and a cost (per container) that is 32 percent higher. For import transactions, these figures are 61 percent, 129 percent, and 39 percent, respectively.⁶ International organizations such as the Inter-American Development Bank (IDB) and the World Bank have initiated programs aimed at addressing some of these difficulties in several countries of the region.

Capacity and Accessibility of 3PL Services

The capacity and accessibility of 3PL services is critical to a country's international competitiveness. There is a wide offering of 3PL services in Latin America and the Caribbean since the region has the world's main actors in this industry. Indeed, it is a business that grows at rates higher than those of the region's economies and even doubles them in some countries. A remaining problem, however, is that SMEs do not benefit from these services. Given the smaller volumes that these SMEs handle, it is commonplace that larger operators decline to provide them services or, if they do offer their services, rarely can SMEs benefit from more appealing rates. Moreover, there is an absence of local logistics operators catering specifically to SMEs.

Promoting freight consolidation through industry-specific organizations or policies that promote the development of a local logistics industry that goes beyond large operators should help overcome this situation, making these services more accessible to the region’s SMEs and, as a last resort, facilitating their access to world markets.

In this context, it becomes important to develop training offerings specifically in logistics, since the only way that an industry of this type can truly become competitive is if its workers receive adequate training.

Required Time for Exports

In Latin America and the Caribbean it takes an average of 18 days to move a container to a port of departure,⁷ while the average for OECD countries is 10.9 days. The number of documents required is 6.6 (4.4 in OECD countries) and the processing cost per container is US\$1,228 (US\$1,059 for OECD countries). These figures improve the total aggregate for emerging areas in the world, but do not make up for the proximity of some of these areas to key markets such as the European market with high levels of purchasing power, or the Asian market, where a large portion of the world population is concentrated. To gain competitiveness as exporters, it is necessary for the region’s countries to continue to work on reducing processing times, bureaucracy, and costs to reach the benchmark values of OECD countries.

Table 1. Days, Documents, and Costs to Export in Different Emerging Regions

Region	Days	Docs	Cost (US\$)
OECD	10.9	4.4	1,059
Latin America and the Caribbean (LAC)	18.0	6.6	1,228
Middle East and North Africa (MENA)	20.4	6.4	1,049
East Asia and Pacific	22.7	6.4	890
Eastern Europe and Central Asia	26.7	6.4	1,652
South Asia	32.3	8.5	1,512
Sub-Saharan Africa	32.3	7.7	1,962

Source: The World Bank “Doing Business” Trading Across Borders Report, consulted in June 2011.

An overall view of the export potential of a region includes the number of days for maritime transit to the port of destination and the number of days for domestic transit in the export process. Table 2 shows that, because of their geographical location, companies based in Latin America are in a favorable position compared with companies in other emerging economies in terms of exports to the United States. This is not, however, true in the case of exports toward Europe or Asia.*

* For domestic freight segments, the average for the region was used instead of that corresponding to the country. For maritime segments, it was assumed that a regular destination port for exports with a determined origin would be used (Rotterdam / Naples in the EU; New York / Los Angeles in the US, according to origin). Source for calculation: Sea.Rates.com, Sea Freight Exchange database on duration of domestic transit. Available at: <http://www.searates.com/container/transit/> [search: June 2011].

Table 2. Average Export Transit Times (in days) from Different Emerging Regions to the European Union and the United States

Destination	European Union (EU)			United States (US)		
	Domestic	Maritime	Total	Domestic	Maritime	Total
Origin						
Alexandria (Egypt)	20.4	4.0	24.4	20.4	16.0	36.4
Santo Domingo (DR)	18.0	13.0	31.0	18.0	4.0	22.0
Cartagena (Colombia)	18.0	15.0	33.0	18.0	6.0	24.0
Santos (Brazil)	18.0	17.0	35.0	18.0	15.0	33.0
Dakar (Senegal)	32.3	8.0	40.3	32.3	11.0	43.3
San Antonio (Chile)	18.0	23.0	41.0	18.0	15.0	33.0
Mumbai (India)	32.3	13.0	45.3	32.3	25.0	57.3
Hong Kong (China)	22.7	23.0	45.7	22.7	20.0	42.7

Note numbers in red denote origination in LAC.

Source: The World Bank “Doing Business” Trading Across Borders Report, consulted in June 2011.

In any case, there are significant differences between countries in the region in terms of the efficiency of export processes during domestic transit. Thus, in addition to the United States and Canada, other countries that stand out for their good practices include the Dominican Republic, Panama, Mexico, Peru, Argentina, and Brazil. Countries such as Chile, Paraguay, and Venezuela need to improve in this area.

Improvement Initiatives Carried Out by Public Entities

The logistics capacity of an SME plays a key role in the success or failure of the process of going international. In this sense, there are several actions that public entities of every country can carry out to improve the logistics competitiveness of its SMEs. These actions cover everything from infrastructure development to the promotion of trade facilitation policies or of associative integration between SMEs, as well as supporting logistics education and training. This section explains some of these activities through an illustration of real success stories in countries of the region.

Infrastructure

For a country’s logistics sector to function properly there needs to be adequate infrastructure. Most of the countries in LAC have understood this and have assigned a large portion of their budgets to infrastructure investments.

Logistics platforms— apart from roadways, railway networks, and ports— are a specific type of infrastructure of great magnitude. They are points in which logistics activities are concentrated, where tasks performed include warehousing, packaging, or consolidation of cargo and where services are provided to carriers. Additionally, they represent a key instrument as logistics education facilities, since they help improve the level of logistics training of firms and professionals in their areas of competence.

In LAC, the development of logistics platforms is still limited, but in those places where they have been set up they have proven to be a decisive component for disseminating industry best practices, particularly to SMEs.

In **Brazil**, for example, several states have used public–private partnership (PPP) agreements to promote the implementation of logistics platforms, such as the Integrated Logistics Center of Sao Paulo. Similarly, other recent developments in this area have been carried out in the Western Amazon (interstate project), Manaus, Aguiarnópolis, Salguero, Juazeiro, Paranaguá, Guaíba, Rio Grande do Sul, Anápolis, and Goiás.

Trade Facilitation

Development of Single Window Schemes

In **Costa Rica**, the development of a Single Window automated system has been a significant step forward in export trade facilitation. The system has been widely accepted by companies in the country, but mostly by SMEs, which now encounter less difficulties in initiating their export activities.

Similarly, in **Guatemala**, the Single Window for Exports (Spanish acronym: VUPE) fulfills the mission of centralizing and coordinating the institutions involved in export formalities and procedures, with the goal of facilitating the international commercialization of Guatemalan products, ultimately contributing to the improvement of the country's competitiveness. Some of the benefits the VUPE offers include an electronic export authorization service, container tracking, customized telephone assistance for exporters, and electronic phytosanitary certification.

Introduction of Customs Risk Management Techniques

In the context of the accelerated growth of the movement of goods, the adoption of risk management techniques allows customs agencies to optimize resources without hindering commercial exchange. This system implies the acceptance that not all fraud attempts will be caught, but offers the best balance between costs and benefits. Additionally, it serves to minimize corruption since automation eliminates the autonomy of inspectors to decide which cargo to inspect.

Support Plans and Support Entities

Development of SME Support Entities

Aware of the importance of the internationalization of firms, numerous countries have organizations that support SMEs wanting to expand their activities to the export market, including Colombia, Costa Rica, Guatemala, Honduras, Nicaragua, and Panama,⁸ among others. Promoting and developing entities with this profile are actions that have mid- to long-term results and have a high impact in terms of what it means to increase activities abroad for the country as much as for every company. From the perspective of SMEs, it is important to know what export support entities are currently available in their country to maximize the benefits they can draw from those entities.

Financial Stimulus Plans

In **Brazil**, the goals of the Growth Acceleration Program (Spanish acronym: PAC) transcend outright infrastructure development. In fact, the plan covers areas as diverse as incentives for foreign investment, financial stimulus plans for businesses, and programs to improve worker education. Ultimately, its priorities are to stimulate the productive efficiency of the economy's main sectors, drive technological modernization, accelerate growth of areas already under expansion, and activate areas that are run-down, thereby definitively increasing the country's competitiveness. Thus, the PAC has allowed Brazilian firms, many of which are SMEs, to grow in terms of logistics competitiveness, and therefore be better prepared to initiate export activities.

In the **Dominican Republic**, a program called PROMIPYME was created in 1997⁹ to support the development of SMEs; the program is still in force. Furthermore, the Dominican Republic, in cooperation with the Inter-American Development Bank, recently launched the FINPYME Export Plus program, which aims to facilitate improved access for SMEs to export markets.¹⁰ Similarly, also worth mentioning is the Competitiveness and Innovation Promotion Program within the framework of the 2010–2030 National Development Strategy, which many SMEs will be able to benefit from. Among the program's objectives are development of a regulatory environment that favors investment, and improved quality and competitiveness and expanded coverage of the transportation and logistics infrastructure, all of which are directed toward territorial integration, support of productive development, and competitive participation in world markets.

Promoting Associative Integration

The promotion of organizations that create alliances between SMEs belonging to the same industry or to a common region tends to bring about beneficial results.

In **Costa Rica**, the vertical integration¹¹ project has been successful in this sense. In 1999, it was discovered that over 200 transnational corporations operating in the country only purchased 5 percent of their inputs from the domestic market. Hence, the goal of improving the technological and productive capacity of Costa Rican SMEs was set so that they could become suppliers to transnational companies and meet their demand for products and services. An understanding of their needs was established through joint collaboration, and a work plan was determined for SMEs to meet these demands with the technical and financial support of local government and the IDB. As a result, 131 contracts were signed, three times as many as originally expected.

Another advantage of integrating SMEs in sector organizations is improved access to big logistics operators and greater negotiating power. Their presence in a specific region tends to greatly contribute to the transfer of best practices in the sphere of logistics. In fact, big industry players are present in most countries in Latin America and the Caribbean, but focus their activities on foreign transnational corporations and big customers in the region. Since their services are hardly affordable to SMEs, the transfer of knowledge and best practices is limited. A solution for this is finding synergies with other export SMEs-

through these sector organizations. Freight consolidation allows for lower logistics costs while facilitating access to these large international operators.

In **Argentina**, several small livestock farmers of Santa Fé Province that wanted to export their products grouped themselves into the Consortium of Small-Scale Meat Exporters of the Province of Santa Fé – Argentina (Spanish acronym: PROGAN). The consortium was originally developed as a support network for small farmers initiating export activities, but now its services cover the collaborative marketing and distribution (logistics) of their products.¹²

Further, through joint financing with the IDB, Argentina has implemented an integrated traceability system for cattle meat that provides the proper infrastructure in terms of information and communication technologies (ICT) needed to update, manage, and safely handle information about every animal and every cut of beef.¹³

Training

Educational offerings in logistics are a fundamental element of spreading and adopting best practices. There are currently very few offerings of logistics training in LAC, and it is usual for informal learning to take place on the job in the case of technical positions and managerial posts.

Although the results of education in logistics are only perceptible in the mid to long term, the governments of countries in the region that have set training among their priorities have started to see the rewards of a mass of workers that are better prepared to meet the requirements of their jobs. This is the case in Ecuador, for example, where the Professional Training and Education Technical Secretariat offers different courses in logistics, warehousing, and transportation.¹⁴

Improvement Initiatives Carried Out by SMEs

The internationalization of SMEs in Latin America and the Caribbean is usually not an easy process, but it turns out to be critical because of its social, economic, and regional impact. Small and medium enterprises create 73 percent of employment and generate 60 percent of the economy's value added in the region.¹¹ A successful internationalization process would increase the customer and supplier base, support better production and distribution technologies, and diversify risks. All of this definitely improves the profitability of an SME, making it more competitive in the global environment and therefore more feasible in the long run.

Logistics plays a crucial role in the growth of SMEs, especially when they decide to reach out to markets outside of their country. In fact, the optimization of supply chain management within a firm is an element that will determine the success or failure of its internationalization process.

In this sense, the logistics performance of SMEs can, to a great extent, be correlated to the leverages and drivers of any company or organization, even if those characteristics related to its size can accentuate the relative importance of some of them, influencing their logistics strategies and policies.

This section reviews those elements that contribute to the implementation of an efficient logistics operation that favors the achievement and maintenance of a competitive advantage. This proposition can contradict the classic view of logistics as a mere cost center.

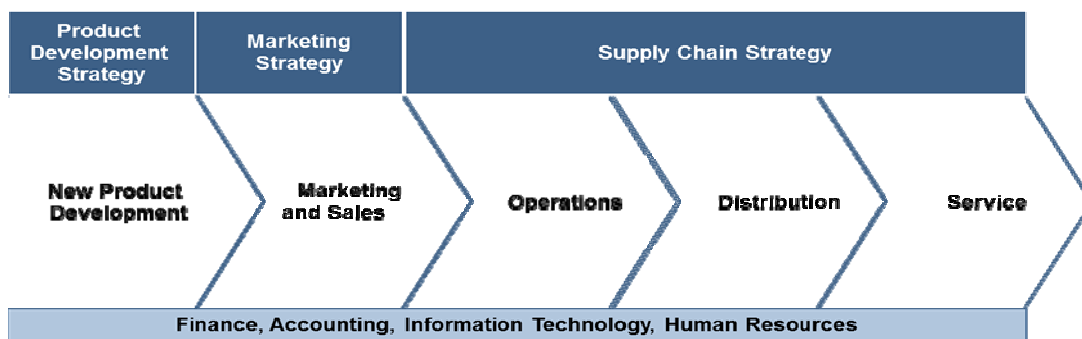
Organization

According to the experiences of the authors in the region, the most common organizational structure used in SMEs is the classical distribution by functional departments. This type of organization is characterized by areas that specialize in a determined function, namely sales, production, finance, operations (logistics), etc. Each area is responsible for a specific part of the process, creating the interfaces required to interact with all other functional areas. While this type of organization can apparently be useful, to optimize every operation, it generally shows a lack in specificity in terms of responsibility over the entire process, while introducing inefficiencies in communication.¹⁵

To attempt to overcome these difficulties, best-in-class organizations use powerful integration systems based on management processes and indicators supported by technology, as well as organizational units oriented toward business processes, or combine them both.

Moreover, a priority issue in this sense is the recognition of the integrating role that logistics plays in a business. This presupposes raising the role of this function from a traditional management view, which describes it as the pure execution of transport and warehousing operations, to a function of Supply Chain Management that links with strategy and business planning to define and implement logistics strategies. Authors such as Chopra¹⁶ and Gattorna,¹⁷ among others, have described the importance of a supply chain that is strategically aligned with the business.

Figure 3. Value Chain According to the Model Proposed by Chopra



Source: Author elaboration

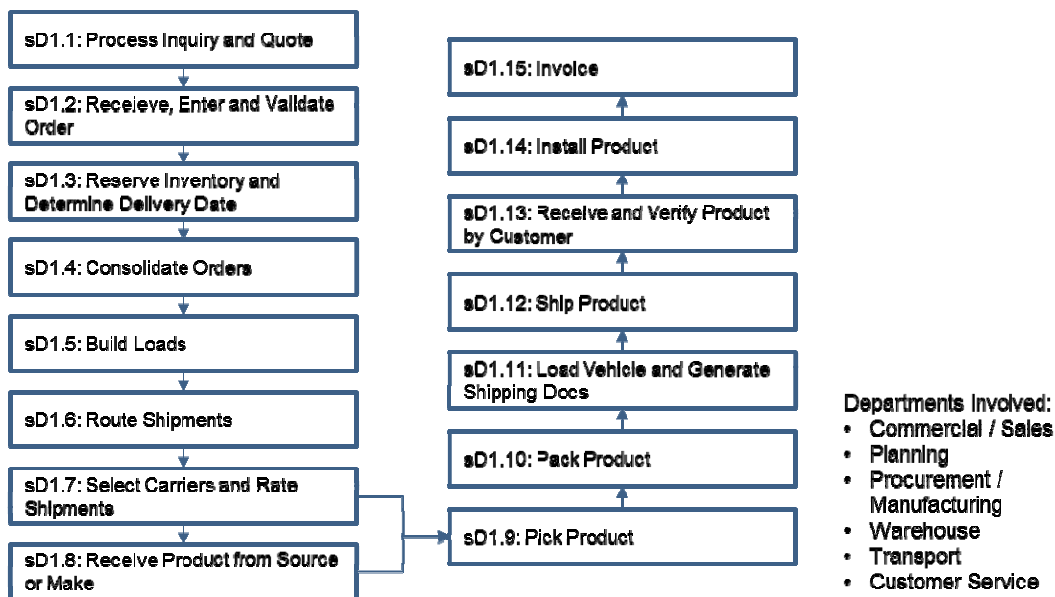
Process Management

Business process management arose as a response to the traditional approach of Taylorism, which divides labor in a company into responsibilities. Its purpose is to align operations with the objectives of the customers and the business. The models for quality (for example, ISO 9000:2000) and for business excellence (for example, the European Foundation for Quality Management [EFQM] or the Malcolm Baldrige Model) have exhibited the importance of process management for over two decades. The ultimate goal of process management is to ensure that all of the processes in an organization are developed in a coordinated manner, improving the effectiveness and satisfaction of all interested parties, such as customers, shareholders, personnel, and suppliers, and even society at large.

In the sphere of operations, the model that has become a worldwide standard is the Supply Chain Operations Reference (SCOR) developed by the Supply Chain Council (SCC). This model is used as a standard supply chain diagnostic tool. Its use as a process reference model that breaks down “macro processes” into processes and subcomponents provides a common language that ensures consistency between indicators used by suppliers and customers (both internal and external). According to this model, for any agent within the supply chain, there are five main areas of action: plan, source, make, deliver, return. Its implementation allows viewing how these areas relate to one another for every individual actor and for the rest of the actors in the supply chain.

Figure 4. Example of a Process According to SCOR Model

Process sD1: Deliver Stocked Product



Source: SCOR Model, Version 10.

The experience of the authors concerning the use of SCOR models in SMEs reveals that this is a tool that facilitates the development of diagnostics and improvement plans for logistics by

- Facilitating definitions and consensus on basic logistics concepts,
- Providing a global view of processes beyond the barriers supposedly created by functional silos,
- Focusing on responding to standard metrics with predefined calculation methods and rules,
- Acting as a source of best practices — by process and by industry type — as a catalyst for the company's own initiatives.

All of this will be of advantage in reducing total logistics costs and improving customer service.

People

A core element of any organization is its people, and the field of logistics is no exception. In a logistics environment that is constantly evolving, where the skills needed to perform a job change rapidly, continuous education to update these skills is the path that will allow businesses in general and SMEs in particular to continue being competitive. Investment in training is costly, but it is more costly to have a mass of workers with educational deficiencies that limit their job efficiency.¹⁸

In this context, the little value that has traditionally been granted to logistics in many organizations has resulted in selection criteria for personnel that have not always been fitting. In many instances, especially at operational levels, those individuals that do not fit into other areas considered to be more important are assigned to logistics. This lessens the interest of the best professionals, both those already inside the company and other candidates for logistics positions.

Similarly, another important deficiency in this field is education and professional training. The logistics profession, as opposed to others, has until recently not had specific offerings, which are still very limited. The lack of qualified management professionals in this area is less common in large corporations and much greater among personnel in SMEs.

All improvement projects in other areas necessarily go through the development of specific training programs. These must follow the guidelines of standards that are consolidated internationally and that offer the possibility of certifying the knowledge obtained. Examples include

- European Logistics Association (ELA)
- International Society of Logistics (SOLE)
- American Society of Transportation and Logistics (AST&L)
- Project Management Institute (PMI)
- Chartered Institute of Logistics and Transport (CILT)
- Association for Operations Management (APICS)

Logistics Metrics

The development of metrics in the domain of logistics is directly related to the concepts of process management and management by objectives. This involves monitoring a series of specific indicators, which allows greater control over logistics operations while directing them toward business objectives.

Although traditionally a cost-based approach has been applied in logistics, companies, including big corporations, have recently started to manage the *total logistics cost* as a critical aspect of the overall business strategy. The total cost takes into account all costs associated with logistics, including transportation and warehousing, but also administration, order management, and inventory. An explanation for this paradox is found in the organization-specific problems already discussed and in their intrinsic complexities, with several actors involved and large amounts of data, not always well supported by information systems. This situation is even worse for SMEs, where a large part of data integration, whenever performed, is made on computer applications.

However, according to the SCOR model, costs are only one part of the metrics that must be included. The group of metrics that are used for decision-making must include internal and external indicators, which also cover areas such as reliability or the responsiveness of an organization's structure.

Table 3. Metrics (Indicators) for Logistics Management

External	Reliability	Ability to perform tasks as expected (e.g., predictability of the outcome of a process).	<ul style="list-style-type: none"> • Right quantity • Right quality • On time
	Responsiveness	Speed at which tasks are performed or in which supply chain delivers products.	<ul style="list-style-type: none"> • Order fulfillment cycle time • Delivery cycle time (includes transportation time) • Planning cycle time
	Agility	Ability to respond to external influences, responding to changes in the market, to gain or maintain competitive position.	<ul style="list-style-type: none"> • Flexibility of supply chain • Adaptability of supply chain
Internal	Costs	The cost of operating the process, which includes labor, materials, management, and transportation.	<ul style="list-style-type: none"> • Cost of goods sold • Cost of labor • Cost of transport
	Assets	Ability to efficiently use assets. Asset management strategies include inventory reduction and in-sourcing vs. outsourcing.	<ul style="list-style-type: none"> • Inventory days of supply • Capacity utilization • Cash-to-cash cycle time

Source: Author

Information and Communication Technologies (ICTs)

In the domain of logistics, as well as in other fields of business management, information and communication systems are a central component, and their importance is reinforced by certain factors.

On one hand, the *real time nature of logistics operations* needs to be considered. Not only does this involve gathering and providing information about the execution of processes for future decision-making, but information about operations such as assigning delivery dates for orders, reserving stock or loading merchandise onto a truck always have to be updated so that is completely trustworthy and available at the location of the operation.

On the other hand, the *extensive nature of logistics operations* needs to be considered. With multiple internal and external actors that require the connectivity of various systems, and the use of standard protocols for information exchange (EDI, XML, etc.), effective integration with 3PL service providers can only be supported through ICTs.

Likewise, there is *growing complexity in the handling of products* as a result of increasing customization and entails an increase in the size of the portfolio, which impedes the effective implementation of inventory, transport, and production policies based on manual processes.

Finally, the *globalization of markets, supply, and distribution* introduces an additional factor of complexity in the identification, planning, and control of transportation routes and associated logistics suppliers. In this case, there is a need for global visibility tools that use exception-based management and that are adjusted to global cooperation and data exchange standards.

All of the above translates into the need for technological support in enterprise resource planning (ERP) systems, logistics execution systems, planning and decision-making systems, and business intelligence systems.

Enterprise resource planning systems support process management, integrating all of a company's information into a single system, which guarantees the consistency of the information. Furthermore, in the case of SMEs, they are useful especially at the moment of the transfer of globally developed standard practices. The main producers (e.g., SAP, Oracle, Microsoft) have already adapted their systems to SMEs, providing pre-configured solutions with set parameters — in some cases, adapted to specialized sectors of economic activity — that can be installed in a shorter time and with less resources than traditional installments at large corporations.

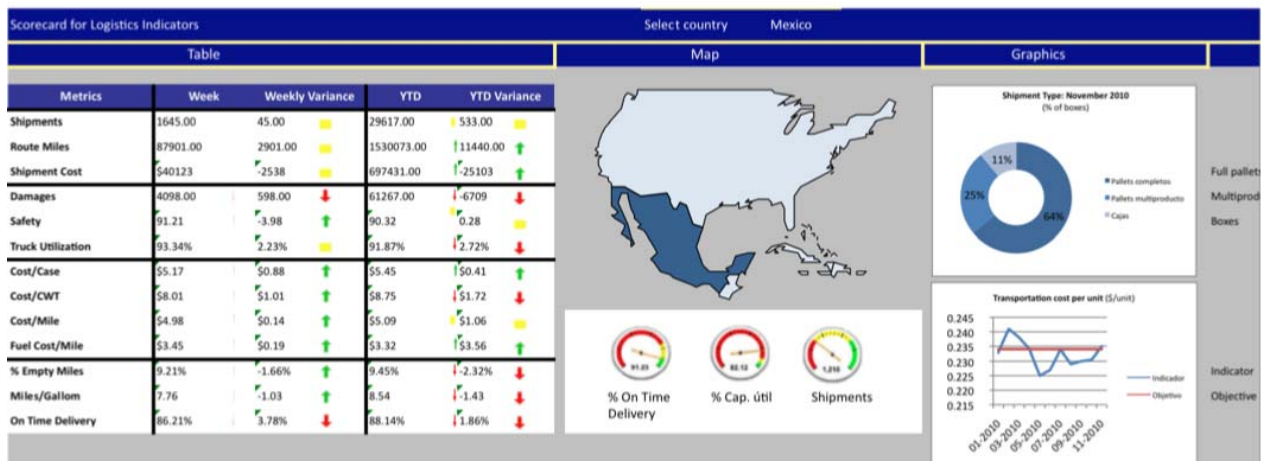
Logistics execution systems basically include Warehouse Management Systems and Transport Management Systems. These solutions are oriented toward guaranteeing the reliable and efficient execution of those processes, taking information stored on the ERP as a starting point. Among these types of solutions, there are some that are specifically designed for SMEs. Hence, there is a growing trend toward providing Software as a Service. This is a model in which software and handled data are stored by the service provider. Therefore, the company only pays for its use, there is no cost for the initial installation, and the provider assumes responsibility for the maintenance, daily operation, and support of the soft-

ware used by the customer. In the case of logistics execution software, there is a tendency for 3PL providers to provide this service as a value added. This alternative can be attractive to an SME since it does not require an initial investment, although it must be clearly linked to a Service Level Agreement and to a contingency strategy to facilitate potential future changes in provider.

The *planning and decision-making systems* include a broad scope of solutions, such as those intended for logistics strategic network planning (e.g., defining nodes, routes, and modes of transportation), demand planning and forecasting, aggregate production planning, and production scheduling. They all share the characteristic of being based on transaction information for short-, mid-, or long-term decision-making. These systems are technologically complex, but when they are deployed, they involve a much more limited number of users than do ERP or execution systems.

Business intelligence systems generate reports and indicators on the basis of data generated by other systems. They can be used to feed the scorecard for logistics indicators.

Figure 5. Example of a Transportation Scorecard



Source: Author

Other Integration Systems

Metrics and management systems based in ICTs constitute the basis for supply chain optimization but, additionally, *performance evaluation systems* are needed to align the behavior of people and departments with the objectives of the organization — in this case, the SME.

It is usual for firms to run into difficulties when trying to implement an effective and objective performance evaluation system, and in certain cases give up their implementation, a decision that can only be described as a mistake. The availability of a good work performance plan is critical for guaranteeing the quality of the evaluation system. Ideally, such a plan should be supported by a compensation system that rewards those workers that show greater alignment with the objectives set in the design of the metrics.

Horizontal and Vertical Collaboration

Another element of a company's logistics competitiveness is its ability to develop collaboration strategies with other organizations in its supply chain or even with competing firms.

Vertical collaboration with clients is an area widely accepted both by the literature and by operational practice as being one of the main areas for improvement. Big manufacturers, especially dealers, are increasingly deploying supplier development programs similar to those that have been applied for a long time in the automotive industry. From this perspective, it is important for SMEs to identify which companies in their vertical chains generate more traction and implement cooperation policies, ranging from the design of products to logistics implementation.

Depending on the size of the SME, it is also possible to apply this approach to *vertical collaboration with suppliers* for services, such as 3PL, or for materials and components. This represents a more advanced stage of capacity development, which requires having previously implemented the project in the domestic domain.

Another possibility is *horizontal collaboration with other supply chains*. In the case of SMEs, this type of collaboration has shown to be especially useful given that one of their main limitations is their difficulty in achieving economies of scale at the moment of hiring logistics services. This constraint is not only reflected in costs but is often also linked to managing the variability of demand and planning for necessary resources.

Thus, when a small agricultural producer, for example, has to reserve containers to export its products, it must calculate demand for its product and, based on quality (which would be determined based on similar exercises in previous years), choose to reserve excess container capacity for all of its production or take the risk of falling short of space and lose the full export. However, if this exercise is done jointly by a sufficient number of suppliers, not only does the cost per container decline, but much lower security stock is needed to guarantee the same levels of insurance coverage for production.

Collaborative initiatives of this kind, organized around clusters or similar arrangements, have shown to be very effective. An international example is the case of textile producers in Morocco. This sector represents 35 percent of the country's exports, but recent changes in the international context—particularly the competition of countries with lower labor costs—put their situation at risk. Individually, the producers lacked the power to face such a situation, so some of them got together and established the MOSAIC Textile Consortium,¹⁹ the first export consortium legally recognized in the country. Its members understood that by coming together they could improve their competitive position because it would help them innovate and diversify their markets. In addition, they decided to unify their marketing and procurement, including logistics and transportation purchases.

Conclusions and Recommendations

The logistics industry is key to guaranteeing the competitiveness of companies in Latin America and the Caribbean in general and SMEs in particular. The sector has remarkable growth potential and principally acts as a motor of private sector development and economic growth for other economic sectors in the region.

Despite the improvements experienced in LAC in recent years, structural logistics problems persist, creating a barrier to exports for SMEs in the region. Even though there are notable differences between countries, and therefore any generalization will have its own exceptions, the major logistics problems faced by SMEs in LAC include deficiencies in logistics education and training; limited access to best practices, technologies, and methodologies for improving supply chain management performance; difficult access to advanced 3PL logistics services; and a lack of collaboration to reach sizes sufficient to compete globally.

In addition to these obstacles, there are structural problems unique to every country, such as limited multimodal connectivity, limited availability of logistics centers to concentrate activities, and inefficiencies of port operations. There are also difficulties derived from the complexity of customs inspections and their associated processes, with a larger impact on SMEs than on big companies that have more resources and experience to address them.

Although these problems are not exclusive to LAC and are also found in other emerging regions, they all represent bottlenecks that negatively affect the export potential of numerous SMEs. They are not, however, insurmountable and, while they slow down the competitiveness of an SME as an export company, they should never become an excuse to withdraw from export activity.

Effective measures that have been widely tested are available to address these issues and have already been implemented by some countries in the region. Such measures include actions that may be developed by SMEs and general actions that can be taken by the country, but these initiatives always have a clear impact on the logistics competitiveness of SMEs. Among these measures, those with the most positive impact are included in the table below. Their implementation in those companies and countries that still have not put them into practice should serve to reduce the logistics competitiveness gap they have with more developed economies and their enterprises, allowing the region's SMEs to increase their competitiveness and export volumes.

Table 4. Areas of Intervention in the Logistics and Transportation Sectors of LAC

By SMEs and their sector associations
<ul style="list-style-type: none"> - Analysis and optimization of the supply chain in alignment with the SME's objectives and strategies - Development of a process management approach and alignment of organization with said processes - Development of systems for indicators - Development of a training plan and performance evaluation - Adoption of ICT solutions in the fields of logistics planning and execution - Promotion by sector associations of freight consolidation among SMEs and the creation of procurement centers for logistics services
By government administration
<ul style="list-style-type: none"> - Development of "Single Window" schemes - Development of risk management techniques in customs organizations - Promotion of the adoption of ICTs in industry companies and government administration - Improvement of education and training in the field of logistics - Promotion of SME access to advanced 3PL logistics services - Increased use of PPP agreements to accelerate the development of new infrastructure - Development of logistics infrastructure: <ul style="list-style-type: none"> • Improved connectivity between different modes of transportation • Development of logistics parks • Development of cold storage infrastructures

Case Studies: The Experiences of a Few SMEs

Despite progress made in the region, SMEs in LAC still face problems in their internationalization process. This section illustrates some of those problems through the analysis of two case studies of SMEs — one in Brazil and one in Mexico.

Trop Brasil

Trop Brasil produces natural and concentrated tropical fruit pulp. It started its operations in 2007 and, in 2010, had revenue of 24 million Brazilian *reais* (approximately US\$14 million). The company began exporting its products in 2008, and exports today represent 5 percent of total sales. The company's principal export destinations are Australia, France, Indonesia, Israel, and Japan.

Currently, Trop Brasil manufactures and sells mango (Tommy Atkins, Palmer, and Ubá brands), passion fruit, guava, papaya, and pineapple pulp aseptically packed in 190 and 200 kilogrambags, stored in steel drums. In the near future, the company plans to add peach and cashew pulp and coconut water to its product portfolio.

All these fruits are processed with state-of-the-art equipment and the highest quality and traceability controls managed by a specialized technical team. In fact, due to the rigorous controls that it regularly conducts, the company has been recognized as an accredited supplier of The Coca-Cola Company.

To ensure the supply of large volumes of products to its clients, Trop Brasil has pioneered a project to encourage fruit growing in the state of Espírito Santo (southeastern Brazil) that guarantees farmers in the region fair prices and an organization for growing, storing, and transporting fruits. The company's modern manufacturing plant is located in the city of Linhares in Espírito Santo, which is strategically located with respect to major consumer centers and the ports of Vitória in the State of Espírito Santo and Rio de Janeiro in the State of Rio de Janeiro.

Table 5. Export Profile of Trop Brasil

Company	Country	Annual Revenue	Employees
Trop Brasil	Brazil	24 million <i>reais</i> (US\$14 million approx.)	100 (approx.)
Products and services			
<ul style="list-style-type: none"> - Aseptic Fruit Pulp (mango, passion fruit, guava, papaya, and pineapple) - Concentrated Fruit Pulp (mango, passion fruit, guava, papaya, and pineapple) 			
Description of the export process			
<p>Trop Brasil coordinates and organizes its whole productive chain, from planting the crops, to producing the pulp, to shipment and final delivery to the client. In the production process, pulps are treated in aseptic bags of 190 and 200 kg and then stored in steel drums, which create an excellent barrier to oxygen. Ships with refrigerated 20-foot containers are used for transportation because of the long distances to the export destinations (Australia, France, Japan, Indonesia, and Israel) that can require journeys of up to 45 days.</p>			

Exports are performed by a customs officer, mainly at three ports: Rio do Janeiro, Vitória and Santos. The CIF Incoterm is used and the payment instrument is a letter of credit.

A factor to be considered is that production is concentrated during November and February and therefore the company accumulates large volumes of stock. Suppliers are located in Espírito Santo, which reduces the price of the supply of its inputs.

To reduce its storage and transportation costs, Trop Brasil is located next to its principal client (The Coca-Cola Company), which accounts for more than 65 percent of its sales. This reduces logistics costs since these are large shipments that are made on a monthly basis or are well programmed.

Difficulties in export competitive position

As mentioned earlier, the main challenges faced by Trop Brasil in its logistics process are

- Fulfillment by their suppliers and clients of the strict quality and traceability requirements of the products.
- Complexity of the customs processes because of the need to certify the products in accordance with international food safety standards.
- Large storage volumes due to the seasonality of production (November and February).
- Production conditioned by the cycles and quality of harvests.
- Loss of competitive position due to currency fluctuations (real/U.S. dollar).

Internal improvement actions implemented

Trop Brasil developed the “Healthy Fruit” project to adapt the fruit it harvests to the requirements and demands of the global market. Over 5,000 fruit producers were trained for this project, and technology was transferred to them to guarantee fruit quality while restricting the use of agrochemicals (pesticides).

In addition to coordinating and following up with their suppliers on a daily basis (co-operatives and producers), Trop Brasil delivers courses and training in conjunction with government research and development agencies such as the Capixaba Institute for Research, Technical Assistance, and Rural Extension (Portuguese acronym: INCAPER).

Soluciones Tecnológicas (Mexico)

Soluciones Tecnológicas (ST) is a Mexican company based in Guadalajara that was founded in 1991. Its main area of business is the analysis, design, and development of high-performance data/image acquisition and instrumentation systems and database management. Its potential clients come from the automotive, aeronautics, and ICT industries that intend to incorporate high technology instrumentation.

The company is expanding; presently it employs 67 professionals with the intention of reaching a staff of 80 during the present year. Revenue reached US\$5 million in 2010. About 50 percent of sales are made outside of Mexico, with the United States and Brazil being the company's main markets. ST has also installed equipment in other countries in LAC, such as Ecuador, Chile, Argentina, Venezuela, and Costa Rica, as well as China and India. Of note, 90 percent of its production is somehow dependent on supplies from other countries.

In 2006, ST opened the Center for Vehicular Electronic Technology, whose objective is to develop systems that efficiently adapt to the changing needs and trends of global markets by carrying out applied technology research and development activities that generate innovation and stimulate process and productivity improvements.

Table 6. Export Profile of Soluciones Tecnológicas

Company	Country	Annual Revenue	Employees
<i>Soluciones Tecnológicas</i>	Mexico	US\$5 million	67
Products			
<ul style="list-style-type: none"> - Embedded systems - Software design and programming - Wireless technology and communication protocols - Hardware design - Design and development of electronic cards and mechanical components - High-performance electronic tools and development of prototypes - Visual inspection station: testing service 			
Description of the export process			
<p>One of ST's areas of business is the execution of turnkey projects that consist of the development of automatic or semiautomatic stations for inspection, assembly, automation, and execution of quality tests in industrial production lines. Since this line of business is characterized as the development of tailor-made products for the client, product volumes and series produced are small. However, even though it is an area of activity that currently represents 7 percent of the revenue, the company intends to promote it by making better use of the import-export legislation currently in force in Mexico.</p> <p>The development of these turnkey projects requires the purchase of different components and subsystems from foreign suppliers (in many cases, registered by the final client), their integration in Mexico, and the subsequent deployment of stations at the client's headquarters, both in the United States and countries in Latin America. Depending on its complexity, the station may require the integration of a greater or lesser amount of</p>			

components and subsystems, which can range from 10 to 20. Therefore, an average of 5 to 15 suppliers, mainly located in the United States, Germany, and France, must be available for each station that is developed.

Once these stations are designed, and following a value-added process with in-house systems, they are exported and installed at the client's headquarters, predominantly in the United States and Brazil. The import-export process is managed internally by ST instead of through outsourcing.

Difficulties in export competitive position

As mentioned earlier, the main challenges faced by the firm in its logistics process are

- Fulfillment of the strict requirements placed on their suppliers by companies of sectors such as the automotive or aeronautic industries, which in many cases determine their logistics processes. This means that sometimes ST must finance expenditures derived from imports made for the development of its activities, in which case these should proceed from suppliers that have been officially recognized by the client. This circumstance makes the firm lose competitiveness vis-à-vis international companies that ship their products to customs without the need to assume the costs of entry into the country of destination.
- Complexity of customs procedures, legal and/or tax requirements established by the Mexican system for import/export of goods and services, especially in the case of SMEs.

Internal improvement actions implemented

- Implementation of an in-house project allowing the company to make efficient use and maximize the available benefits of the set of international treaties regarding cargo and import-export customs and administrative procedures, underutilized to this day by ST.

Among other benefits, the Manufacturing, Maquiladora, and Exports Services Industry program (IMMEX) is an instrument that allows goods of foreign origin that will be exported following a transformation and value-added process to be imported without having to pay the general import tax and the value-added tax. Originally developed for big companies, this instrument is usually not efficiently taken advantage of by smaller firms. With the efficient utilization of this facility, an opportunity opens up for ST to improve its competitiveness, given the characteristics of its activities of having to import highly specific goods from outside of Mexico, as per the client's authorization, for the purpose of introducing them into a development and value-added process in the country for later deployment of such technological developments in other countries.

- Development of a seamless information system integrated with the company's ERP that supports the full chain of supply, customs procedures, integration, and re-export process. This system must contemplate issues related to costs and timing as well as legal requirements that facilitate the identification and resolution of possible incidents along the supply chain.

The implementation of the IMMEX requires the strict compliance of certain procedures such as:

- Inventory control: program import tariff codes and their presence in authorized destinations.
- Control of length of stay of merchandise in Mexico.
- Justification of destination of merchandise for which they were authorized.

This system will help ST efficiently and automatically control the fulfillment of the above-mentioned procedures.

Acronyms

3PL/4PL	Third Party Logistics/Fourth Party Logistics
CSCMP	Council of Supply Chain Management Professionals
EDI	Electronic Data Interchange
EFQM	European Foundation for Quality Management
ERP	Enterprise Resource Planning
EU	European Union
ICT	Information and Communication Technologies
IDB	Inter-American Development Bank
IMMEX	Manufacturing, Maquiladora, and Exports Services Industry (acronym in Spanish)
INCAPER	Capixaba Institute for Research, Technical Assistance, and Rural Extension (acronym in Portuguese)
LPI	Logistics Performance Index
MENA	Middle East and North Africa
OECD	Organisation for Economic Cooperation and Development
PAC	Growth Acceleration Program – Brazil (acronym in Spanish)
PPP	Public–Private Partnership
PROGAN	Consortium of Small-Scale Meat Exporters of the Province of Santa Fé – Argentina (acronym in Spanish)
PROMIPYME	Promotion and Support to Micro, Small and Medium-Sized Enterprises – Dominican Republic (acronym in Spanish)
SCC	Supply Chain Council
SCM	Supply Chain Management
SCOR	Supply Chain Operations Reference
SMEs	Small and Medium-Sized Enterprises
VUPE	Exports Single Window – Guatemala (acronym in Spanish)
WCO	World Customs Organization
WTO	World Trade Organization

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