Chapter 14
Strategic Challenges of the Portuguese Automotive Industry:
In Search of an Iberian Sourcing Strategy

António Carrizo Moreira
University of Aveiro, Portugal

Ana Carolina Soares de Carvalho
University of Aveiro, Portugal

ABSTRACT

The main objective of this chapter is to define a set of strategic lines, from the public policy point of view, so that Portuguese suppliers of the auto industry can deploy a strategic alignment throughout the supply chain in order to position themselves as potential suppliers of the global sourcing strategy of their Iberian Peninsula clients. The characterization of the auto industry in Portugal and Spain is undertaken, framing the perspective of this industry and proposing the strategic guidelines for the Portuguese auto components industry to supply the Iberian market. The study supports a synergistic strategy between the Portuguese auto components industry and the Spanish automotive industry in order to increase the Portuguese incorporation in downstream activities of the supply chain. Portuguese auto components suppliers should adopt international relational strategies throughout the value chain in order to source their Original Equipment Manufacturer (OEM) clients and to reinforce their position as global suppliers. The strategy involves the consolidation of the Portuguese automotive cluster as global suppliers through specialization.

INTRODUCTION

The auto industry is recognized as a global industry, with large implications at economic, regional, and entrepreneurial level (Celada, Carneiro, Moreira, & Pereira, 2007). Major international original equipment manufacturers (OEMs) are looking forward, on one hand, to becoming more visible in leading world markets and, on the other hand, to working with their international suppliers, in order to deploy global strategies and to gain market share.

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The systemic perspective of the automotive industry is very particular, since the supply chain and the strategic alignment of its players is very important for all of parties involved (Oke, Pragojo, & Jayaram, 2013; Celada et al., 2007). Furthermore, large manufacturers are very important, both nationally and regionally, as anchor companies (Celada et al., 2007) leveraging the internationalization of their suppliers in the value chain (Moreira, 2007).

Nowadays, the auto industry is in a quite complex economic scenario. The global demand has been decreasing, especially on traditional markets, and the burden of the financial system is eclipsing the consumption as customers expenditures are decreasing due to lack of liquidity and bank financing.

Moreover, automotive manufacturers focus more and more on design activities, engine and main subassemblies manufacturing, and components and subsystems assembly, delegating more responsibilities to the suppliers of equipment and auto components, both in manufacturing and equipment assembly as in complex systems and functions that suppliers deliver to OEMs.

Clearly, the complementarity between suppliers and producers throughout the supply chain is crucial to the automotive industry. The complex process of international consolidation, with a strong trend towards mergers, acquisitions and strategic alliances, where operating globally has become a key success factor, leads large producers to seek international visibility in major markets. In turn, suppliers seek to be tuned with their clients seeking to complement their activities throughout the supply chain. Therefore, in order to position themselves as main/preferred suppliers of their foreign clients, suppliers of the automotive industry need to be prepared to internalize the advantages of their clients' global sourcing strategies. As such, the purpose of this chapter is to define a set of strategic lines, from the innovation public police point of view, so that the Portuguese auto components companies can underpin their competitive advantages deploying global supply strategies throughout downstream activities in the supply chain, so that they can be part of the global sourcing activities of the main players of the Iberian automotive market.

In order to achieve the above mentioned purpose, a theoretical review of global sourcing strategies was carried out. Afterwards the auto industry in Portugal and Spain was analyzed and diagnosed. Then, the strategic guidelines for the automotive industry are defined. Finally, the main conclusions are discussed.

GLOBAL SOURCING

Worldwide competitiveness has significantly increased since the 1990s. Nowadays companies seek new sources of sustainable competitive advantage in an increasingly globalized market. One of the areas where companies search for globalization benefits is global sourcing (Trent & Monczka, 2003).

According to Zenz (1994), sourcing is a strategic philosophy that consists in selecting suppliers, making them a part of the purchasing company strategy for the supply of a particular component. Therefore, sourcing does not refer simply to the act of obtaining materials at a desirable price; it also includes the decision to incorporate sourcing in the operations strategy in order to support or even improve the competitive advantage of such company (Zeng, 2000).

Today, many companies want to tighten up their relationships, being more cooperative in their business partnerships with their suppliers. As there are more companies competing in the global market, global sourcing is increasingly playing a major role in the companies' buying strategy (Zeng, 2000). In addition, as developed countries are changing from a production-oriented strategy to a service-oriented one, international sourcing became inevitable (Zeng, 2000). The automotive industry is strongly oriented towards

the internationalization of the supply chain, with inward-outward relationships. The reality has shown that in highly competitive environments, many manufacturers offshored their activities in low-cost countries or outsourced components and/or finished products from low-cost suppliers throughout contracts between OEMs and auto parts manufacturers (Kotabe & Murray, 2004). Afterwards, the focus is on coordinating the activities throughout the supply chain in order to deliver such products in the various international markets.

Major global players develop and produce products that are introduced and commercialized simultaneously in several countries (Alguire, Frear, & Metcalf, 1994). In order to achieve such purposes, these players look for technology, materials, and components through suppliers localized all over the world (Kotabe, 1990; Ohmae, 1990; Poter, 1990).

There are some specific terms in academic literature to describe the purchasing process in international markets, such as domestic purchasing, international sourcing and global sourcing (Zeng, 2000). Nowadays, global sourcing has gained strength.

Johnson and Wood (1996) define international sourcing as buying components and inputs anywhere in the world, in such way that the manufacturer builds a vast network abroad in the search for supplying sources instead of just trusting its domestic sources. According to Spekman (1991), global sourcing deals with the efficient use of human, energy, material and capital resources worldwide. According to Bozarth, Handfield and Das (1998), international sourcing only involves buying to suppliers outside the company's production country, and is essentially a reaction to the increase of global competition, lacking the coordination requirements among geographically dispersed business units. Global sourcing, on the other hand, demands the integration of requirements, so that it is possible to identify common purchases, processes, technologies and suppliers that can be coordinated. This demands the implementation of globally centralized management teams and information systems that allows assessing the requirements and performance all over the world (Bozarth et al., 1998). However, it is the definition of global sourcing put forth by Monczka and Trent (1991a) that has been mostly used. Monczka and Trent (1991a) define global sourcing as the integration and coordination of procurement requirements throughout business units seeking items, processes, technologies and suppliers.

Monczka and Trent (1991a, 1991b, 1992) suggest that a company's sourcing growth follows a four-stage development process, evolving from a strictly domestic purchasing strategy, to the development and implementation of global sourcing strategies. The four stages is classified in the following four phases (Monczka & Trent, 1991a, 1992): phase 1, which involves strictly domestic purchasing only; phase 2 in which foreign buying is based on need; phase 3, which involves foreign buying as part of procurement strategy; and phase 4 in which the company integrates its global procurement strategy. One can witness that the level of international sourcing in the above mentioned phases span from none (phase 1) to low (phase 2), to medium (phase 3), and finally, to high (phase 4). Each stage is part of the company's competitive environment, demanding specific investments in terms of resources, staff, participation, management and infrastructure (Bozarth et al., 1998). When companies intend to implement global sourcing, the first task is to search for international suppliers capable of satisfying the companies' needs.

In order to successfully implement global sourcing strategies, it is important to fully understand the stage of development of this strategy and to have access to sources of information about external suppliers (Zeng, 2000). Companies in the domestic purchasing stage are not committed to international purchasing activities (Monczka & Trent, 1991a, 1991b, 1992). There is little need in seeking information from international suppliers,

and all goods that are not produced internally are purchased and made available through internal sources.

Companies will enter the subsequent stage reactively when raw materials and/or components are not available on the internal market, or when the internal supply base is inadequate to fulfill the clients' needs (Monczka & Trent, 1991a). International purchases are made based on short-term needs, where firms get the international support from subsidiaries or other corporate business units abroad to find out local domestic suppliers to their international purchases (Zeng, 2000).

In the third phase, international direct sourcing becomes a dynamic part of the company's procurement strategy, starting by building international purchasing offices (Zeng, 2000). International sourcing strategies developed in this stage are aggressive sourcing answers, tuned with the global market point of view (Monczka & Trent, 1991a). When a company reaches the third stage, global sourcing is often seen as the key to the internationalization strategy of the firm.

In the final phase, companies distinguish themselves by developing a global sourcing networking, with purchasing systems and coordination mechanisms worldwide. This level of development demands the integration of the organizational and informational system, in order to coordinate the global supply needs across several divisions all over the world. By doing so, organizations may maximize their purchasing advantage, profiting from design and manufacturing resources from the best worldwide suppliers (Bozarth et al., 1998).

When companies want to implement global sourcing strategies, their first task is to search for foreign suppliers that are able to satisfy their needs (Zeng, 2000). According to Min and Galle (1991), there are several sources of information about potential foreign suppliers, with private sources being the most popular ones, such as professional contacts, business newspapers, directories, trading companies and importing agents.

Global sourcing allows companies to capture local advantages (Porter, 1991). Since factor costs vary from country to country, companies can take advantage of these cost differences by localizing supply chain activities in countries that hold a comparative advantage on factors, in which a certain activity is used intensively (Kogut, 1985). With the growth of global competition, supply chain functions became more geographically dispersed and the interorganizational links became more complex (McGrath & Bequillard, 1987).

Low prices are the most frequently cited purchasing reason when following a global sourcing strategy, especially by highly industrialized companies (Monczka & Giunipero, 1984; Spekman, 1991; Handfield, 1994). The rising logistic costs lead companies to turn towards the evaluation of the global sourcing total costs, which include transportation costs, customs fees, taxes, handling costs, storage costs or damaging on arrival, amongst others (Fawcett & Birou, 1992). In some cases, the computation of such costs make the total cost of global sourcing greater than the costs of domestic purchases (Bozarth et al., 1998), and logistic costs may be compensated when purchasing large volumes.

Currently, more and more companies all over the world are able to produce components and high-quality end products at the same level, or even at a higher level than similar products available by European and American suppliers (Handfield, 1994; Carter & Narasimhan, 1990; Min & Galle, 1991). Therefore, companies often acquire materials and components abroad, so that they can have access to advanced production technologies. Joint-ventures and strategic alliances are strategic mechanisms frequently used on the prosecution of that purpose.

Some countries are naturally better sources of certain commodities and have better suppliers. If companies want to completely explore the advantages given by those sources, they should build their own unique competitive advantage (Bozarth et al., 1998).

The importance of global sourcing has been increasing drastically. However, it is necessary to understand this strategy according to the profile of companies with global purchasing activities, the kind of items purchased on international markets, and the reasons for global sourcing (Zeng, 2000).

Without establishing sourcing, distribution and service networking plans, it is extremely difficult to simultaneously exploit emergent technologies and potential worldwide markets (Kotabe & Murray, 2004). As a result, the increasing rate of the introduction of new products and the reduction of time to market of innovative products, demand a more proactive management of corporate resources and global sourcing awareness. Kotabe and Murray (2004) sustain there are two important issues in which firms need to compete globally: (a) the logistics management of worldwide research and development (R&D), manufacturing and marketing activities, and (b) retaining the company competence in accessing its suppliers' resources in conceiving and developing components and end products. These characteristics allow the company to better understand the costs and product quality implications of its relationship with its suppliers.

According to Frear, Metcalf, and Alguire (1992), it is necessary to understand the importance of the sourcing strategy from a number of aspects, which may include: the types of companies that source globally; the types of items purchased from international sources; the reasons for global sourcing; and the capabilities of international suppliers and how they add competitive value.

According to Frear et al. (1992), the main characteristics that lead companies to global sourcing are the following: improvements in the company's competitive position, lower prices, better availability, better quality, better terms of delivery, higher levels of technology, countertrade obligations and relationships with a foreign subsidiary. Forces that hinder global sourcing include: local content requirements, local instead of global attitude, unavailability of items abroad and government assistance. In addition, there are several major obstacles that influence the success of international sourcing: travel costs, transportation delays, foreign exchange fluctuations, quality assurance, contract terms, language, paper work, inspection procedure, culture/customs, political stability, trade barriers, company integrity, and nationalism (Frear et al., 1992).

According to Trent and Monczka (2003), there are few truly global suppliers, although this situation is changing lately. A global supplier has the ability to competitively comply with the demands of a global buyer everywhere, in terms of design, cost, product quality, cycle time and delivery.

The importance of global suppliers becomes clear when one examines the automotive industry. Given that most OEMs of the auto industry operate regionally, the suppliers' community is equally structured to operate regionally through regional agreements, sometimes due to the lack of worldwide qualified suppliers (Trent & Monczka, 2003). Of course, the demands and challenges proposed to global suppliers are greater than those proposed to local and regional suppliers.

Regardless of the nationality, many companies have a limited range on global sourcing, being therefore in disadvantage when compared with companies that exploit the most out of their abilities in a global competitive market (Kotabe & Murray, 2004).

Currently, manufacturers produce under the competitive pressures based on price-quality improvement, producing according to the just-in-time (JIT) philosophy, which demand tight working relationships with component suppliers, and add an enormous responsibility to purchasing managers (Kotabe & Murray, 2004).

When a global company adds up another international unit to its network of existing units, a new need for supplying components and other semi-processed goods is created from the new unit to the existing ones, thus, global manufacturers contribute decisively to global sourcing activities, both within the company and between independent suppliers and new plants (Kotabe & Murray, 2004).

AUTOMOTIVE INDUSTRY IN PORTUGAL

Historically, the automotive industry in Portugal has been going through several changes in terms of both number of assembly units and number of suppliers of components.

In the 1990s, there were 12 assembly units operating in the automotive industry in Portugal (Moreira & Carvalho, 2012). Nowadays, the automotive industry is composed of only five major players: PSA Peugeot Citroën, Toyota Caetano Portugal, Mitsubishi Fuso Trucks Europe, Volkswagen Autoeuropa and V.N. Automóveis (ACAP, 2013).

Overall, in 2012 assembly units operating in Portugal produced 163561 vehicles. Although the national automotive production has been generally declining, this decrease in production is particularly strong between 2008 and 2009, as shown in Table 1.

Car passenger vehicles are the core of the national automotive production. Autoeuropa is the largest automotive producer nationwide, contributing in 2009 with 68.8% of the total vehicle production in Portugal (ACAP, 2012).

The production of vehicles in Portugal is characterized for its export-oriented nature. According to Table 2, from 2009 to 2012, about 98% of the vehicles produced were destined to foreign markets, mainly to the European market.

The auto components industry in Portugal holds an equally standing position having grown steadily over the last years (AFIA, 2008).

The automotive components industry in Portugal involves the following subsectors: (1) electrical and electronic equipment; (2) interiors; (3) chassis, brakes, suspension, steering and wheels; (4) engines and their components; (5) Outer parts; (6) molds and tools; (7) metallurgy; (8) organic and chemical products; and (9) support services. The electrical and electronic equipment is the

Table 1. Motor vehicle production (in units) in Portugal per factory

Assembly Units (Models)	Production of 2008			Production of 2009			Production of 2012		
	PC	LCV	HIV	PC	LCV	HIV	PC	LCV	HIV
VW Autoeuropa (Alhambra / Seat; Sharan, Eos, Sirocco / VW)	94100	-	-	86008	-	-	112550	-	-
PSA Peugeot Citroën (Peugeot Partner, Citroën Berlingo)	38142	23528	-	15672	18858	-	3185	40755	-
Mitsubishi Fuso Truck Europe (Canter)	-	6080	4806	-	1404	1446	-	1451	2666
Toyota Caetano Portugal (Hiace, Dyna, Optimo)	-	5596	351	-	1728	239	-	1331	50
V.N. Automóveis (Série N)	-	1284	1578	-	192	478	-	284	1279
Total	**132242**	**36178**	**6735**	**101680**	**22172**	**2163**	**115735**	**43831**	**3995**

Source: Own preparation from ACAP (2009, 2010, 2013).

Note: PC – Passenger car; LCV – Light commercial vehicle; HIV – Heavy industrial vehicle

most representative subsector, contributing with 28.9% of the auto parts industry sales volume, followed by the interiors with 23.6%, chassis, brakes, suspension, steering and wheels with 20.1% of sales volume (AFIA, 2009).

In 2009, the sales volume of the components industry rose up to 3,680 million Euros, from which only 736 million Euros were destined to the Portuguese market (AFIA, 2009). It is important to mention that from 1996 to 2007, the sales volume grew over 50%.

Overall, there are between 180 to 200 companies within the automotive components industry in Portugal, being their geographical distribution predominantly on the districts of Aveiro, Porto, Setúbal, Braga, and Leiria (AFIA, 2009).

The major client of the components suppliers is the Volkswagen Group, which holds a preponderant weight in the entire industry. In the same way, there are other large economic groups that stand out as clients of the auto components industry, as shown in Table 3.

In the supply chain, 51.1% of the sales volume is achieved by Tier 1 suppliers, 26.2% by Tier 2 suppliers, and 5.5% by the third line supplies (Tier 3) (AFIA, 2009). It is worth mentioning that the

Table 2. Vehicle production on exports in Portugal

Assembly Units	2008		2009		2011		2012		International Markets
	Production Units	Exports Units	Production Units	Exports Units	Production Units	Exports Units	Production Units	Exports Units	
VW Autoeuropa	94100	92760	86008	84867	133100	131673	112550	11918	France, Germany, United Kingdom, Austria, Spain, Italy, Switzerland, USA, Asia, Africa, Oceania.
PSA Peugeot Citroën	61360	61360	34520	34520	50290	50290	43940	41676	France
Mitsubishi Fuso Truck Europe	10886	9392	2850	2329	5498	5066	4117	3916	France, Germany, United Kingdom, Austria, Italy, Switzerland, Asia.
Toyota Caetano Portugal	5947	3559	1967	583	2033	880	1381	894	France, Germany, United Kingdom, Austria, Spain, Italy.
V.N. Automóveis	2862	2671	670	589	1331	1133	1573	1573	Germany, United Kingdom, Spain.
Total	**175155**	**169742**	**126015**	**122888**	**192242**	**189042**	**163561**	**159977**	**Total**

Source: Own preparation from ACAP (2009, 2010, 2012)

Table 3. Major clients of the components industry

BMW	Fiat	Mahle	Robert Bosh
Continental	Ford	Mitsubishi	Toyota
Daimler	General Motors	Nissan	TRW
Delphi	Johnson Controls	PSA Peugeot Citroën	Visteon
Faurecia	Lear	Renault	Volkswagen

Source: AFIA (2009)

aftermarket accounts for 11.2% of sales volume and the remaining 6% are allocated to other industries, such as aeronautics, electrical and electronics, home appliances, and others (AFIA 2009).

In terms of distribution sales per country, Germany holds first place with 25.5% of the total share, followed by Portugal with 20%, Spain with 18.3%, and France with 13.4% (AFIA, 2009).

The Portuguese automotive industry is one of the most dynamic and innovative industries of the national economy. The production of automobile vehicles and their components make up one of Portugal main exporting industries, representing 11.3% of all exported products in 2009. Also in 2009, the auto components industry represented 2.2% of the gross domestic product (GDP). Still in the same year, components companies employed approximately 38,500 employees (AFIA, 2009).

The automotive industry in Portugal reached a sales volume of 15 billion Euros, in a universe of 36,000 companies, representing 2.5% of total national employment and a total of 128,000 direct jobs (ACAP, 2010).

AUTOMOTIVE INDUSTRY IN SPAIN

The automotive industry in Spain is characterized by the presence of large groups of worldwide manufacturers whose headquarters are outside Spain, as presented in Table 4. Vehicle and truck manufacturers in Spain are key players of Spanish industrial activity, counting with nine vehicle manufacturing companies and 15 factories of both vehicles and components.

In 2011, manufacturers of automotive vehicles in Spain produced ten brands and 33 models, against the 13 brands and 44 models of vehicles produced in 2008 (ANFAC, 2008, 2009, 2011).

In 2011, Spain produced 2,373074 vehicles, as shown in Table 5. Foreign markets are the main destination for near 89.4% of the Spanish production, mainly European Union (EU) countries. Table 5 shows some of the characteristics of the automotive industry in Spain (ANFAC, 2011).

More than half of the top ten selling models in Europe in 2009 were manufactured in Spain, even though the production units have moved away from the 2000-2007 average, where production reached 2.9 million vehicles and exports reached 2.4 million vehicles (Gonzalo, 2010).

Analyzing the production of vehicles per autonomous regions in the year 2011, Catalonia stands out as the region with the largest share, followed by Castile and Léon and Aragon. Table 6 shows the referred vehicle production per regions in 2003 and 2011 (ANFAC, 2012).

The cost structure of vehicle production (71% for raw materials, components and equipment, 10% for logistics costs, 10% for labor, and the remaining 9% distributed in other accounts, such as energy costs) reflect the importance of the cost of raw materials in the automotive industry and the automotive equipment and components manufacturing, which significantly increase the impact of logistic costs (Gonzalo, 2010).

Table 4. Assembly units operating in Spain

Firm	Factory	Brand	Models
Renault España	Valladolid	Renault	Modus; Clio
	Palencia	Renault	Megane
Ford España	Valencia	Ford	Focus, Fiesta, C-max
General Motors España	Zaragoza	Opel	Corsa; Meriva; Combo
Peugeot Citroën Automoviles España	Vigo	Citroën	Xsara Picasso; C4 Picasso; Berlingo
		Peugeot	Partner
	Madrid	Peugeot	207
Seat	Barcelona	Audi	Q3
		Seat	Altea; Ibiza; León; Exeo
Volkswagen	Navarra	Volkswagen	Polo
Iveco Pegaso	Valladolid	Iveco	Daily
	Madrid	Iveco	Trakker; Stralis
	Barcelona	Iveco	Euroridder; Cityclass
Mercedes Benz	Alava	Mercedes	Viano; Vito
Nissan Motor Ibérica	Barcelona	Nissan	Pathfinder; Navara; NV 200
		Renault	Trafic
		Opel	Vivaro
	Avila	Nissan	Atleón; Cabstar

Source: Own preparation from ANFAC (2011).

Table 5. Production and exports of Spanish manufacturers automotive vehicles

	2008	2009	2010	2011
Motor vehicle production	2,541644	2,170078	2,387900	2,373074
Car passenger production	1,943049	1,812688	1,913513	1,839068
Industrial vehicle production	598595	357390	474387	534006
Motor vehicle Exports	2,180852	1,883175	2,079782	2,121068
Car passenger exports	1,655154	1,555149	1,658341	1,642578
Industrial vehicle exports	525698	328026	421441	478490
% Total exports over Total production	85.8	86.8	87,1	89,4
% Total Motor vehicle exports over Total exports (value)	13.1	12.9	12.0	11,7
% Total Motor vehicle imports over Total imports (value)	6.4	6.6	4,1	4,3

Source: Own preparation from ANFAC (2008, 2009, 2012)

Table 6. Percentage of vehicle production by regional autonomous community

	2003	2011
Catalonia	17.7	20.8
Galicia	15.6	15.0
Castile and Léon	19.6	15.8
Aragon	17.4	15.4
Andalusia	0.7	0.0
Basque Country	2.2	3.7
Navarre	8.1	14.9
Community of Madrid	6.0	4.8
Valencian Community	12.7	9.7

Source: Own preparation from ANFAC (2012)

Spain has one of the strongest automotive equipment and components manufacturing industries worldwide, with about 1000 companies that generated in 2009, 23 billion Euros, generating 170000 direct jobs (ICEX, 2009). Compared to 2008, the automotive and components manufacturing industry decreased its invoice and employability, whose value reached 29,979 million and 208766 jobs (ICEX, 2009).

The equipment, components and accessories for the auto industry includes a number of products that are split as: (a) engine and transmissions equipment; (b) electrical and electronic equipment; (c) chassis equipment; (d) body; (e) tires and wheels; (f) rubber and rubber products; (g) accessories; (h) bearings; (i) plastics and chemicals; and (j) other test equipment and testing tools, etc. (ICEX, 2009).

The EU is the main trading partner of Spain, bringing together more than 80% of the total exports value and over 90% in imports, with France and Germany standing out in both cases (Gonzalo, 2010). The main exported products are: accessories, engines, bodywork and tires (ICEX, 2009). Companies in this industry are innovative, flexible and competitive, exporting over 58% of its production, which indicates a high degree of internationalization. Table 7 summarizes the main market destinations, as well as their values in Euros for 2008 and 2009.

The auto parts industry is increasing its importance in the car process production, as the number of subcontracts and pre-assembled systems are increasing over time. Over the last years, the

Table 7. Market destinations for equipments, components, and accessories

Ranking	Country	2008	2009
1	France	3,415392	2,637018
2	Germany	3,204284	2,600336
3	United Kingdom	1,209803	901178
4	Portugal	1,053565	823831
5	Belgium	889343	513248
6	Italy	675116	510747
7	Poland	306804	364268
8	Czech Republic	317296	295575
9	Turkey	378636	205801
10	Netherlands	273344	204823
	Total (Top 10)	**11,723585**	**9,056823**
	Other Countries	**3,111290**	**2,348285**
	Exports Total	**14,834875**	**11,405109**

Source: Own preparation from ICEX (2009).

auto parts industry is strongly investing in R&D, and assuming more complex functions such as coordination of other suppliers (ICEX, 2009).

Taking into account its sales volume, the main companies are: Ficosa Internacional, Grupo Antolin Irausa, CIE Automotive, Dalphi Metal, Valeo, Siemens VDO, Michelin, Pirelli, Grupo Mondragon (ICEX, 2009).

The automotive industry plays an important role in the Spanish economy, representing overall 9% of the active population on the year 2009, which corresponds to a labor force of 65814 workers in the auto assembly units (ANFAC, 2009) and about 170000 workers in the auto components industry (Gonzalo, 2010), contributing with 3.3% of GDP.

DEFINING THE STRATEGIC GUIDELINES BETWEEN PORTUGUESE SUPPLIERS AND SPANISH PRODUCERS

Having analyzed the Portuguese and Spanish industries, the purpose is now to determine a broad set of strategic guidelines towards a long-term oriented, innovative sustainable development, so that the Portuguese auto industry sustainability is achieved.

The definition of strategic guidelines are meant as strategic options to be taken for the development of the automotive industry in Portugal, taking into account the global supply chain to serve the Iberian automotive industry. Three hierarchical categories were defined according to three different strategic lines, as represented in Figure 1: Base Strategy, Leverage Strategy, and Development of the Automotive Industry in Portugal. These hierarchical categories stem from the fact that, from the policy point of view, the leverage strategic lines can be deployed once the base strategic lines are implemented. Following the same perspective, the top category, the strategic lines for the development of the automotive industry can only be deployed once the leverage strategic lines are implemented.

Based on these categories, four axes are going to be proposed. Axis 1 – the development of structural conditions – and Axis 2 – alignment of public policies and business strategies – are tuned with the base strategic lines. Axis 3 – innovation and diffusion of new technologies – is tuned with the leverage strategic lines, whereas Axis 4 – Market development – is tuned with the category strategic development of the auto industry.

For each axis, strategic needs, opportunities and threats are going to be pinpointed. They correspond to the prevalent characteristics found in the Portuguese automotive industry. As a result, strategic objectives and actions will be defined to address the abovementioned intricacies of the automotive industry. While axes 1 and 2 are necessary as a bottom line for creating the conditions for Portuguese firms to operate successfully in the automotive industry, axes 3 and 4 are clearly meant for paving the way for those Portuguese firms to embark in international relationships and to be able to tackle the Iberian market and be positioned as credible global suppliers.

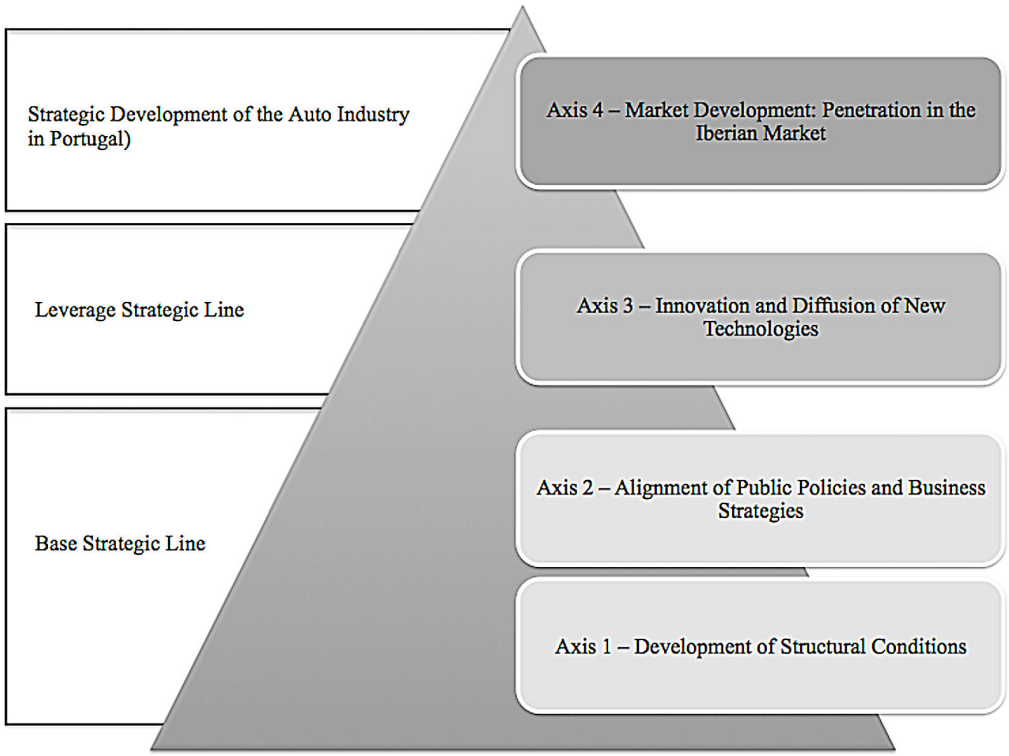
The proposed actions for each axis involve several players of the auto industry, as component suppliers, international systems integrators, OEMs, educational and training automotive institutions, automotive R&D and innovation institutions, business and trade associations, and engineering organizations.

Axis 1: Development of Structural Conditions

In order to develop the strategic sustainability of the Portuguese auto industry, it is necessary to develop structural conditions that can support the execution of all strategic axes. Therefore, there are big challenges that materialize the auto industry capacity to respond all threats and take on brand new opportunities:

- The qualification of human resources and recruitment of talents are crucial so that

Figure 1. Strategic axes
Source: Self elaboration



the Portuguese economy and society ensure a sustainable growth in the future;

- The promoting of intermediate qualification is an important issue, in order to meet the needs of technical and middle management in technological areas, whose offer is barely existent or inadequate;
- A sustainable development strategy based on the reinforcement of innovation skills and competence in the scientific and technologic areas. This implies the creation of programs and projects able to diffuse R&D, that should be strengthen with partnerships between university research centers and interface institutions involving companies, universities and technological centers;
- Taking on opportunities generated by information technologies (IT), developing multiple initiatives on the national auto industry;
- The investment on communication and logistic infrastructures in order to reduce the peripheral geographic distance of Portugal *vis-à-vis* other main competing countries. This investment aims at reducing this geographic impact, which presupposes the focusing and hierarchization on the projects that can offer a wider variety of external relations – telecommunications, airports, and deep water ports, as well as intermodal transportation axes towards Iberia and the center of Europe;
- Due to the ever increasing importance of intangible assets on the firms' growth, the diffusion of venture capital support, to deploy innovation-based activities;
- The creation of an innovation support financing model based not only on costs, but also on results achieved in order to promote the scientific and technical areas in parallel

with the typical administrative and process oriented evaluation of innovation projects;
- The creation of an entrepreneurial and innovation-based culture.

Strategic objectives of Axis 1:

- To promote the basic required conditions to achieve the sustainability of auto industry in Portugal.
- To develop the competitive capability of the business fabric and to strengthen the industrial base.
- To promote innovation and technological development levels of the Portuguese companies.
- To promote human resources qualification.

Proposed actions for Axis 1:

- Stimulating the qualification of human resources;
- Encouraging intermediate human resources qualification, namely on technological areas;
- Reinforcing innovative skills and capabilities on technological and scientific areas;
- Developing R&D mobilizing programs;
- Encouraging industry firms the use of IT on the daily basis;
- Investing on communication and transportation infrastructures;
- The creation of a model to finance innovation activities;
- Promoting innovation-based incentives.

Axis 2: Convergence between Public Policies and Entrepreneurial Strategies

There is a lack of adequate relationship amongst all stakeholders of the auto industry, especially involving public policies actions and companies' strategies.

The main role of public policy is to create the conditions for the development of the economy. They are based on a wider and cross-sectional intervention encompassing companies across several industries which may influence the Portuguese auto industry.

Regarding horizontal actions, some economic, science, technology and fiscal policy measures need to be put forward. In the core of economic policies, investment incentives should be defined, namely in order to: attract private investments; generate the modernization of companies; deploy technological development activities, and generate employment, amongst others.

Partnerships, mergers, acquisitions and business creation should be stimulated, in order to promote and facilitate the development of technological and business partnerships, entrepreneurship, as well as the creation and development of emerging businesses and technologies. The availability of financial supporting mechanisms plays a key role for the strengthening of lasting relationships among companies.

The support to internationalization is crucial, given both the reduced size of the national market and of the size of the Portuguese firms. This support could be made through: incentives to investment, the diffusion of information and policy mechanisms to support plans for investing abroad, as well as support plans facilitating the intermediation among players.

The development of human resources is urgent in order to fulfill companies and industries present and future needs. Thus, the implementation of training and qualification policies should allow the creation of a qualified and productive human resources base.

When it comes to science and technology policy, the essential strategic lines stem from the creation of technological infrastructures, allowing the structured supply of activities and services according to the sectoral development strategies, supporting R&D activities. The aim is to facilitate the interaction and cooperation among firms and

between companies and science and technology entities, so that sound technical and specialized counseling services are provided.

Regarding fiscal policy, an international oriented fiscal framework should be implemented so that Portugal can increase its foreign direct investment attractiveness in order to underpin the development of new businesses. Moreover, the development of socioeconomic developmental factors should be taken into account in order to stimulate the creation of new jobs and the investment on technological modernization in activities related to the generation and exploitation of distinctive competences, such as engineering, product development, styling, branding, R&D, intellectual property, among others.

These broad-encompassing policies can contribute to the favorable development of various companies and industries. However, it is desirable to develop more specific actions intertwined with public policies and companies' strategies so that a long-term sustainable development of the auto industry can be achieved.

On a more specific level, a set of integrated and structured actions should be carry out to stimulate economic relational dynamism among actors in order to create new basic conditions for the auto industry to prosper (INTELI, 2003). Examples of such projects could be the development of city cars or *green vehicles*.

Strategic objectives of Axis 2:

- To develop integrated initiatives in order to empower the auto industry and the automotive components industry;
- To develop both the Portuguese auto industry and the automotive components industry in Portugal for them to become globally competitive;
- To create public policies that support business strategies while creating competitive advantages for both the Portuguese auto industry and the automotive components industry in Portugal.

Proposed actions for Axis 2:

- Encouraging public and private investment;
- Encouraging the companies' modernization;
- Investing in technological development activities;
- Supporting the creation of partnerships, mergers and acquisitions;
- Developing technological and business partnerships;
- Supporting internationalization;
- Encouraging the creation of technological infrastructures;
- Encouraging the coordination and cooperation amongst companies and between companies and research and development entities;
- Inducing socioeconomic development factors.

Axis 3: Innovation and Diffusion of New Technologies

The innovation and diffusion of new technologies are important to the economic growth of the automotive and auto components industries in Portugal. The development and emerging technologies diffusion process tends to evolve into a new challenging phase through the development of new applications based on emerging technologies, on the development of cross-sectoral applications and on the interaction with established technologies.

IT, clean energy technologies and new materials technologies stand out as the most important due to the pervasive effects to the economy. Amongst information technologies, innovation stems from the creation of new integrated circuits, memories and signal processing, which allow an exponential growth of the information process capacity. The evolution towards network computing, the rapid development of cloud and grid computing, the development of wide band wireless communications, the photonic consolidation as a key cable

communications technology and the development of ubiquitous virtual information processing are some of the outcomes of the transformations of information technology.

Clean energy technologies include the first uses of hydrogen as fuel, and the diffusion of a wide set of solar energy systems, namely regarding the use of photovoltaic centrals, without disregarding innovation from other renewable energy segments. Nevertheless, there will still be incremental technological innovations that allow preserving and efficiently using fossil fuels, which will remain essential over the next decades.

On the other hand, materials technologies cover the development of artificially-structured new functional materials, which will serve as development basis of photonics, electronics and solar energy technologies. New composite and recyclable materials and an integrated and simultaneous approach regarding the development of new products and materials, as well as product and processes engineering are going to be the bedrock for those technologies to emerge.

These technologies will be associated to the rapid growth of a globally organized group of activities and industries, and to the creation of rapid growth segment related with mature activities.

The sooner the economies deepen their participation on development and diffusion of these technologies have greater possibilities to growth, which will have positive consequences on industrial development, namely on the auto industry. Even though the development of such technologies is expected to be related to dynamic and innovative regions on USA, Asia and Northern Europe, Portugal should keep striving on a more proactive attitude towards the development of new applications of these emerging technologies, deploying their implementation domestically, namely on the auto industry. This innovative behavior would allow attaining competitive advantages *vis-à-vis* other countries.

Strategic objectives of Axis 3:

- To disseminate new technologies;
- To embed innovation-driven practices on national companies;
- To disseminate the development of new technological applications;
- To implement new technologies in the national auto industry supply chain;
- To provide both automotive industry and auto components industry with advanced emerging technologies in the production of auto components as well as in the automotive assembly units.

Actions proposed for Axis 3:

- Pioneering the diffusion of innovation and new technologies across auto industry companies in Portugal;
- Rooting and disseminating emerging technologies across the automotive and auto components industries in Portugal;
- Promoting the development of new applications of new technologies across the auto industry supply chain;
- Disseminating State incentives for the acquisition of new technologies.

Axis 4: Market Development — Penetration in the Iberian Market

Market development involves the development of skills and capabilities on engineering and product development areas, based on strategic partnerships that allow auto and automotive components industries in Portugal to gain some competitive edge and strengthen their participation in international supply chain networks.

Entering the international supply chain would involve an agreed upon relationship with different intermediate tiers throughout the supply chain. This involves agreements/relationships with various automotive components suppliers working together in the supply of integrated products or

components. As such, entering the international supply chain is an important step in working with companies across borders.

In this sense, this involves a strong focus on internationalization, in which working proactively and in cooperation with other clients of the value chain allows the exploitation of opportunities in many markets, such as in Central and Eastern Europe.

Due to the proximity and attractiveness of the Spanish automotive market, the main target should be on the development and penetration of the Iberian market.

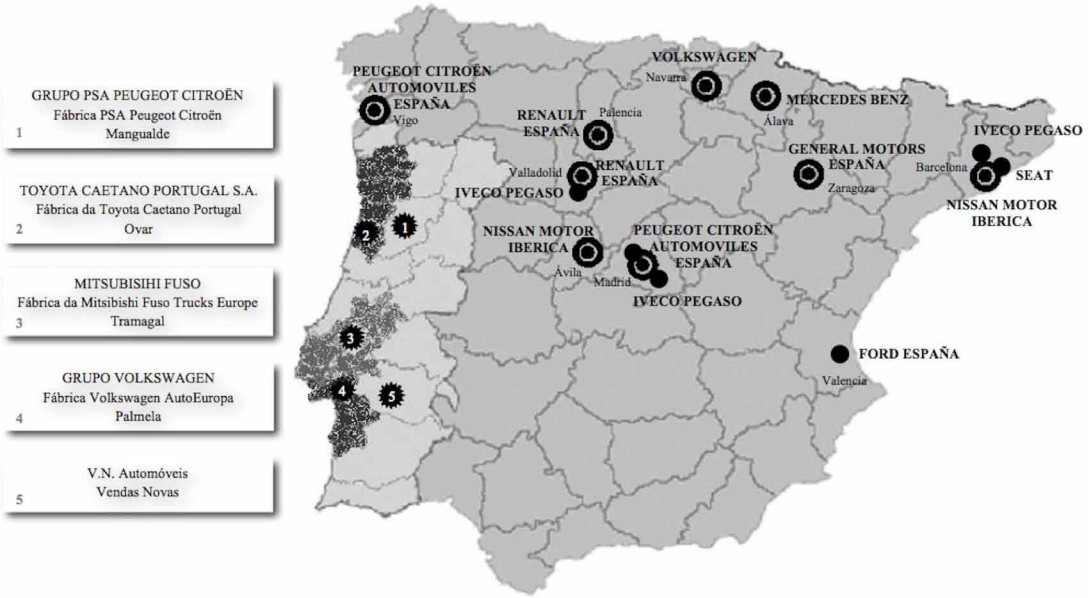
The Spanish market represents an opportunity to expand abroad as its production is clearly greater than the production in Portugal. The Spanish auto industry is characterized by the existence of qualified labor at a relatively low cost, when compared with the average prices practiced in Central Europe, and by its geographic proximity to other European countries, which makes the Spanish automotive industry attractive to several OEMs.

These facts led several major worldwide manufacturers to invest in Spain. Most European manufacturers have production plants in Spain, as well as the vast majority of the leading auto parts producers.

As shown in Figure 2, the automotive industry in Spain has a distributed pattern, although there is a higher concentration on the North. The location of the PSA industrial unit in Vigo might be important opportunity for Portuguese suppliers to expand abroad. Nevertheless, given that in this industrial market relational aspects are important, it is recommended to take into consideration all large units listed in Table 4, since they represent unique market penetration opportunities for Portuguese automotive components firms.

In order to increase its national incorporation, the auto components industry in Portugal should

Figure 2. Portuguese and Spanish automotive industries
Source: Self elaboration



invest in supplier-client partnerships with Spanish auto industry players. Thus, relational strategies based on supplier-client involvements throughout the supply chain, including aspects such as product costs, JIT delivery, quality management procedures and new product development processes are of key importance.

Many opportunities may arise for the auto parts units located in Portugal from the Spanish operating auto assembly units. Therefore, supplying Spanish OEMs will allow increasing scale economies of national auto parts units, to consolidate skills and production capabilities, quality and technology management practices. Some companies will have the opportunity to anchor its position in the supply chain by providing more integrated products than they do nowadays. It is worth noticing that the consolidation of competencies and the relational success in the supply chain can open new windows of opportunity towards relationships with corporate headquarters, at least in the long term.

Strategic objectives of Axis 4:

- To expand the market reach of the Portuguese automotive industry;
- To expand the auto parts companies reach to downstream activities in the supply chain;
- To raise national incorporation;
- To promote partnerships among auto components units so that they can supply integrated solutions;
- To incorporate the auto parts industry in the Iberian auto cluster;
- To raise national incorporation in the domestic market;
- To strengthen the business fabric and the production base in order to create inter-regional competitive capacity;
- To promote innovation and technological development activities;
- To strengthen the local economy based on extending and upgrading the supply of specialized services;
- To promote the qualification of human resources and equity of access to the cross-border labor market;
- To consolidate and institutionalize mechanisms for cross-border cooperation.

Actions proposed for Axis 4:

- Encouraging and coordinating R&D activities aimed to developing skills in the automotive and auto parts industries;
- Promoting the creation and launching of a auto industry R&D support framework, emphasizing long-term research, technological, materials and industrial processes strategic choices;
- Promoting the creation of an integrated R&D network involving automotive R&D entities and technological institutions;
- Promoting the creation of R&D departments in the automotive units in order to internalize R&D skills across the business fabric focusing on the design and manufacture of innovative products;
- Promoting the national automotive industry image as a specialized automotive cluster that is able to conceive, develop and produce specialized high added value products and technologies;
- Promoting cooperation among players and throughout the supply chain following a holistic integrated perspective, leveraging the industry competitiveness;
- Promoting of interaction between the Portuguese and the Spanish auto clusters in terms of production, quality, logistics and new product development;
- Encouraging the internationalization of Portuguese companies;

- Promoting the creation of new innovative firms in specialized services;
- Promoting human resources development;
- Strengthening foreign direct investment.

CONCLUSION

The proposed strategic axes are hierarchically organized as a pyramid. On its base one can find the following axes: Development of Structural Conditions, Axis 1, and the Alignment of Public Policy and Businesses Strategies, Axis 2. The development of structural conditions focuses on the growth on basic characteristics of the sustainable development of the automotive industry, namely the development of human resources qualification, the reinforcement of innovate skills and capabilities in scientific and technological areas, the investment in communications and transportation infrastructures, the promotion of logistics, as well as the creation of an entrepreneurial, innovation-based culture. However, it is necessary for these characteristics to be aligned with business strategies so that public policy actions cover the actual needs of the business fabric.

In an intermediate position, Axis 3, Innovation and Diffusion of the New Technologies, serves as leverage for the Axis 4. Innovation and new technologies deserve a particular emphasis because they are important both to the auto industry and to the national economy to grow. Accordingly, the Portuguese public policy should invest in a more proactive attitude towards the creation and development of new emerging technological applications.

At the top of the pyramid one can find Axis 4: Market Development: Penetration in the Iberian Market. Market development encourages the Iberian market penetration, in order to develop engineering and product development competences, based on strategic partnerships that enable the participation on large international supply chains.

The Spanish automotive market is highly attractive in terms of size and proximity. Therefore, to increase the national incorporation in the Spanish market is essential for the auto parts industry to grow internationally.

Following this rationale, the Portuguese auto components suppliers should try to exploit the Iberian nearby market where large automotive OEMs are implanted, as it is shown in Table 4 and Figure 2.

That being said, Portuguese firms should attempt to strengthen their roles in the global auto supply chain, namely supplying auto OEMs across the Iberian Peninsula. Portuguese auto component suppliers will have to adopt sustainable internationalization strategies and strengthen their positions as OEMs suppliers. The strategy seeks the consolidation of the automotive industry by specializing and providing global solutions, implementing a strategic supplier-client alignment, allowing Portuguese suppliers to enter the sourcing strategy of its Iberian OEMs clients.

The Portuguese auto parts industry needs to increase its national share through the integration of the internal market with the foreign market, increasing the involvement with the Iberian auto cluster, through cooperative actions and partnerships in the development of new products and auto suppliers' network.

Axes 1 and 2 are clearly necessary for paving the main conditions for firms to operate competitively in the international automotive industry. But it is not sufficient as firms need to add value to their international clients, as Zeng (2000) and Monczka and Tent (1991a, 1992) claim: companies will only enter in international or global sourcing strategies when material and components of their international supply base are better than those they can find in their domestic market. As such, Portuguese auto components suppliers need to climb the technology ladder if they want to be part of their clients' international/ global sourcing strategies.

These days there is a clear paradigm shift, which leads to the national auto industry in having a chance to redefine and restructure itself, particularly on design and development of "green vehicles".

Portuguese firms R&D activities need to be tuned with the latest technology state of the art. In order to keep abreast of new technological developments, they need to implement partnerships with relevant entities such as technology centers and universities.

Axes 3 and 4 are meant to reinforce the Portuguese automotive and auto components industry paving the way for an Iberian market penetration. In this situation, it will be important to align possible supplier-client relationships with Iberian auto companies, based on new product development competences and on technological strategic partnerships, so that Portuguese players can be positioned as international or global suppliers. As Kotabe and Murray (1992) indicate, it is possible to implement a global sourcing strategy only when firms are capable of implementing the logistics management of worldwide R&D and manufacturing ideas, and retaining the competence to access to their suppliers' resources in conceiving and developing new products and components. Mirroring the situation, it is possible to state that Portuguese auto components suppliers will be part of international or global sourcing strategies only when they are capable of supplying worldwide R&D and manufacturing centers, and of adding value with their new product development (NPD) competencies.

Given the scale of Autoeuropa when compared to the Spanish market players, it is necessary to diversify the anchor of the Portuguese automotive industry development, as the auto industry needs to have an outward orientation in order to be able to supply automotive units in the Iberian auto cluster. To do so, becoming trustful partners is essential to enter the global sourcing of Spanish automotive manufacturing units. This decision clearly comes from the comparison between the Spanish and Portuguese auto industries, as presented in previous sections. Stimulating the progressive involvement in downstream activities in the value chain must be achieved through internationalization strategies, where Portuguese firms must be strategically aligned with major manufacturers in Spain, in order to make the supply chain interesting to all stakeholders involved. However, there needs to be a coordinated action among first, second and third line suppliers, in order to reduce production costs, improve productivity, which along-side with transportation costs enable a competitive price in foreign markets. In general, the small size of most national suppliers and the lack of economies of scale have conditioned the defined strategies. Nevertheless, the set of the strategic axes defined, paved the way towards the creation of economies of scale provided by international sourcing strategies of Spanish OEMs.

Clearly, the Iberian market is an excellent opportunity for automotive components companies, given the dimension that the Spanish automobile market has *vis-à-vis* the Portuguese market, as well as its geographical proximity. Entering as credible partners throughout the supply chain is not only desirable but also possible. Moreover, entering in the Iberian sourcing strategies of major Spanish automotive OEMs is therefore possible and can (or should) be carried out in the progression of Portuguese suppliers in their downstream path in the supply chain of the European automotive industry. The challenge is launched. An evolution towards a global sourcing can start by an Iberian sourcing strategy.

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KEY TERMS AND DEFINITIONS

Automotive Industry: The set of companies and activities involved in the production of motor vehicles, which includes their components such as bodies and engines. The industry's main product is the passenger vehicle, although light trucks, pickups, vans and sport utility vehicles are common. Commercial vehicles are secondary products, but are no less important.

Diffusion of Innovation: A theory that seeks to explain how, why, and at what rate new ideas and/or new technologies spread in the market.

Global Sourcing: Global sourcing occurs when a firm aims to exploit global efficiencies in the delivery of a product or service from the global market for goods and services across worldwide geopolitical boundaries. Normally, it involves exploiting global efficiencies in the delivery of a product or service and is often associated with a centralized procurement strategy for a multinational firm.

Innovation: The process of translating an idea or invention into a good or service that creates added value for the customers, who are normally willing to pay for the added value. This innovation must satisfy a new need.

Original Equipment Manufacturer (OEM): It is a company that supplies equipment to other companies to resell or incorporate into another product using the reseller's brand name.

Strategy: A method or plan used to bring about a desired future as a consequence of achieving one goal or solution to an envisaged problem. In this chapter the strategy involved the proposition of four axes: Axis 1 – the development of structural conditions; Axis 2 – alignment of public policies and business strategies; Axis 3 – innovation and diffusion of new technologies; and Axis 4 – Market development.

Supply Chain Management (SCM): Although in general terms it involves the management of goods, normally it includes the movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin/manufacturing to end customers. It is very important as it involves the provision of products and services. It might involve a complex competitive infrastructure, complex logistics and the synchronization of the demand and supply. It involves the integration of different organizational areas as operations, logistics, procurement and strategy.