

Cafaggi, Fabrizio et al.

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## Accessing the global value chain in a changing institutional environment: Comparing aeronautics and coffee

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**IDB WORKING PAPER SERIES No. IDB-WP-370**

# **Accessing the Global Value Chain in a Changing Institutional Environment**

## **Comparing Aeronautics and Coffee**

Fabrizio Cafaggi, Luana F. Joppert Swensson, Ronaldo Porto Macedo Junior, Tiago Andreotti e Silva, Clarissa Piterman Gross, Lucila Gabriel de Almeida, Thiago Alves Ribeiro

**November 2012**

**Inter-American Development Bank**  
Integration and Trade Sector

# **Accessing the Global Value Chain in a Changing Institutional Environment**

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Fabrizio Cafaggi, Luana F. Joppert Swensson, Ronaldo Porto  
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This paper is part of the Inter-American Development Bank research project “International Fragmentation of Production and Insertion of Latin America and the Caribbean in Global Production Networks” consisting on a series of case studies that were conducted during the 2011-2012 period in order to analyze the barriers that countries in the region face to insert in global value chains and the potential role for the public sector to help mitigate these barriers. The project was coordinated by Juan Blyde of the Integration and Trade Sector and Ricardo Carciofi of the Institute for the Integration of Latin American and the Caribbean (INTAL) with the technical supervision of Timothy Sturgeon from MIT and the general direction of the Trade and Integration Sector Manager, Antoni Estevadeordal

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## **Abstract<sup>1</sup>**

The aim of the paper, based on empirical research in Brazil, is to investigate how supply chains have evolved over time, what factors have driven this evolution and also how a specific set of contractual practices along these chains is linked to access to international markets.

The two selected case studies in the field of agriculture and aeronautics permit comparison between different modes of accessing international markets and GVCs; they illustrate the roles of transnational corporations and those of public institutions both at domestic and international levels in promoting access and determining its modes and potential spillover effects onto local production systems.

More specifically, the research identifies the alternative channels of access to GVCs and international markets, and the institutional, legal and economic obstacles which prevent access or make it very costly. It looks at the role of intermediaries who control access to international markets, examining when they operate as gateways and when as bottlenecks. It examines both private and public actors, trying to disentangle when they facilitate and when they hinder access. It focuses on the most relevant factors that may attract foreign direct investments in human and physical capital to Brazil.

**JEL Classification:** F23, K12, L14, O54

**Keywords:** Global Value Chains, Access to International Markets, Contractual Practices, Brazil

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## I—INTRODUCTION

The research questions designed by IDB aim at identifying drivers and bottlenecks to accessing global value chains (GVCs) based on the premise that participation in a GVC is beneficial for small- and medium-sized enterprises (SMEs). In a worldwide context where production is ever more fragmented, the competition occurs between supply chains rather than individual multinational corporations (MNCs). States and public policies both at domestic and transnational level must adapt to this change in order to attract investments and create new opportunities for growth. It is worth exploring in more depth the economic and institutional contexts that can generate these benefits for SMEs in Latin America.

GVC has become not only an explanatory concept for industrial organization but also a key reference for policy design. The focus on foreign direct investment (FDI) policy, targeting single organizations, has been slowly replaced by a supply-chain approach where strategic considerations—concerning the web of contractual and noncontractual relationships of the leading firms—are taken into account by emerging economies' governmental policies.

Public policies concern both conditions to access and upgrading along the chain. Access is dependent upon size, financial stability, and regulatory and technological capabilities. Once the threshold of access is passed, firms can move along the chain, upgrading their status and changing their contractual relationships.

Becoming part of a GVC not only increases the volume of trade but also provides business opportunities even outside the chain. These opportunities can be fully exploited when no exclusivity clauses are deployed in the relationships among participants in the supply chain. We address three main questions: why is access to GVCs beneficial, who should have access and who decides about access, and where access should take place along the supply chain.

**Why.** GVCs produce internal knowledge which often drives competitive advantages. The leading enterprise transfers knowledge to suppliers, which in turn transfer all or part of that knowledge to the subcontractors. The extent to which knowledge is transferred along the chain and how freely it can be used depends upon the degree of co-making of the product and is regulated by different contractual arrangements. The boundaries between inner circulation of knowledge and its availability for developing new entrepreneurial skills on the supplier side contribute to identifying the potential benefits of accessing the GVC.

Ever more processes and products are subject to different regulatory regimes, operating both at international and domestic level. Compliance with these regulations often



requires high investments not only in knowledge but also in physical capital. The leading enterprise and, to some extent, the certifiers transfer regulatory capabilities to the participants of the chain in order to meet regulatory requirements which the upstream firms can use even outside the relationship with the MNC. Access to GVC becomes an instrument to increase skills in order to comply with international regulations.

**How.** Access may be beneficial only with certain conditions concerning the legal instruments deployed, in particular the type of contract with MNCs. Empirical research shows that there are different modes of entering GVC. First, firms can become individual subcontractors or suppliers of other firms engaged in contractual relationships with MNCs. Second, they can create collaborative ventures to generate economies of scale, scope, and specialization in order to meet the threshold often designed by MNCs to start a contractual relationship. These networks are created to facilitate the relationship with the MNC, which has an interest in delegating to the network both tasks and the compliance control associated with them while maintaining control. Third, firms can merge in order to meet the MNC's requirements. Often firms engage in multiple strategies and may try to access GVCs both individually and via networks. We would like to explore the strategic variables that induce firms to develop each strategy and how they combine the two.

In particular, we will investigate the use of contractual and organizational networks as a way to access the GVC, distinguishing between formal and informal networks. Formal networks can take different forms such as consortia agreements, joint ventures, and strategic alliances. In this case, the MNC has a contract directly with the network, which then distributes tasks among the participants, ensuring compliance. Informal networks are teams of firms, often created by the multinational for the purpose of sharing information, enhancing coordination among different stages of the production process, and facilitating technology transfers. Suppliers or subcontractors operating in the team do not have any legally meaningful ties but for clauses in each contract which impose duties to cooperate loyally with other participants. At the end of the empirical research, we want to test the adequacy of the Brazilian legal framework and verify whether legislation in contract law, and particularly commercial contracts, provides a sufficiently rich menu from which parties can select the best options to profitably access GVCs.

**Where.** The length of the supply chain varies across and within sectors. Access is often an incremental process whereby upgrading becomes a key objective. Upgrading is

dependent on growth that occurs within the chain on the basis of both endogenous and exogenous factors.

Therefore, we will proceed with this analysis in two case studies of two different sectors of the Brazilian economy and explore modes of access to GVCs depending on the markets, modular, relational, captive, and hierarchy types of value chains.

During preliminary research we identified some sectors of the Brazilian economy in which the insertion of SMEs in GVCs have been relevant. Based on this preliminary research, and given the aim of the project to identify not only drivers and bottlenecks to accessing GVCs but also to perform a broader analysis concerning why, how, and where access can be beneficial, two sectors were selected: aeronautics and coffee.

The aeronautics sector is a very interesting one in Brazil, in that it allows analysis of the extent to which the existence of a multinational in the internal market (such as Embraer) facilitates or hinders the access of SMEs to other GVCs. The coffee sector, on the other hand, allows us to look at the different effects of access to GVCs that, in this special case, has led to the creation of a new market—the differentiated coffee market—with the transformation of a traditional commodity product into one with a much higher added value.

Within these two relevant sectors of the Brazilian economy we have chosen two firms (case studies) that successfully became part of GVCs through different paths: Grauna S.A. in the specific sector of components in the aeronautics industry, and Daterra Atividades Rurais Ltda. in the specialty coffee industry.

The importance of the two different case studies is that they enable the comparison between different modes of accessing international markets and GVCs. The cases illustrate the roles of transnational corporations and public institutions, both at domestic and international levels, in promoting GVC access and determining its modes, and the potential spillover effect onto local production systems. They may be able to provide, as requested, clear insights of the barriers that SMEs of Latin American countries face in accessing GVCs and the potential roles of the public sector to help mitigate these barriers.

## II—THE AERONAUTICS SECTOR

### 1. Global Industry Section

#### 1.1 Main Actors, Products, Trade Volumes

The aerospace industry can be divided into three segments: a) the aeronautics industry (production of airplanes and helicopters), b) the space industry (space platforms production, spaceships, and services), and c) the defense industry (missiles, combat airplanes, and other aerospace applications to the military area) (Luz, 2010) (see Figure 1). In 2008, the global aerospace industry reached a value of USD 674.6 billion (Wipro Council for Industry Research, 2009).

The aeronautics industry is composed of four segments: aircraft, subsystems and equipment, aircraft engines, and land support systems. The aircraft segment is organized into four subsectors: assembling, airframes, parts and components, and services. The aircraft engine segment is composed of three sections: motor production, components, and services (see Figure 1).

The industry is highly concentrated, with only a few companies having relevant revenues in the sector. Geographically, only a few countries are significant: Brazil, Canada, France, Germany, Japan, Russia, the UK, and the United States (Niosi and Zhegu 2010).

In fact, concentration is one of the main characteristics of the aircraft sector, being a continuous process both in the civil and military industry.<sup>2</sup> Aircraft manufacturers must have a high degree of economies of scale and scope to support the high costs of R&D, design, assembly, marketing, and upgrading, and also to survive the industry's cyclical downturns.<sup>3</sup>

Concentration, however, is a characteristic not only of aircraft manufacturers, but of subsystem and component suppliers as well. One of the causes of this concentration process was the new supply strategy adopted in the 1990s by most aircraft manufacturers (see next section in industry trends). The strategy involved a significant decrease in the number of first-tier suppliers and the delegation of development and integration tasks to the remaining ones,

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<sup>2</sup> There were two main “waves” of consolidation in the aircraft industry—the first one in the 1960s after the Second World War and a second, stronger one in the mid-1990s—that have affected both the United States and Europe. According to Horng, in the United States, the consolidation process of the '90s was encouraged by the Department of Defense in response to the declining defense budgets and a significant reduction in the number of new acquisition programs. After that period, in fact, Boeing remained as the only U.S. aircraft producer. On the other hand, the U.S. concentration forced Europe to respond with national consolidation in order to be able to compete with the newly restructured market (Horng, 2007).

<sup>3</sup> On the other hand, as affirmed by Niosi and Zhegu, large size is also advantageous for aircraft firms that depend heavily on government financial support, regulations, and assistance in foreign market penetration (Niosi and Zhegu, 2010).

mainly through a risk-partnership system. Therefore, in order to meet the needs of systems integrators, which included the necessity of investments in R&D, the major subsystem and key component suppliers themselves had to go through a concentration movement in order to benefit from cost reduction by economies of scale and scope (Liu, Nolan, and Zhang, 2008).

Therefore, regarding commercial aircraft manufacturers, the main players are represented by a few companies, with Boeing and Airbus competing for the large commercial aircraft market while Embraer and Bombardier compete for the commuter market (Salles et al., 2009). Their revenues in 2010 were, respectively, USD 36.6 million, USD 31.834 million, USD 2.889 million, and USD 8.614 million (Thisdell, 2011) (see Table 1).

Similarly, in the aircraft engines segment only a few powerful players dominate the market. The top four manufactures are GE from the United States, Pratt & Whitney from Canada, Rolls-Royce from the UK, and Safran from France. They usually work using contractual agreements (e.g., joint ventures, alliances) that involve other suppliers of parts and components of high complexity for specific projects, such as development and production of a new turbine. Their revenues in 2010 were, respectively, USD 15.680 million, USD 12.935 million, USD 10.875 million, and USD 7.424 million (Thisdell, 2011) (see Table 2).

These facts show that the aircraft market is an oligopolistic one.

Among the characteristics of the aeronautics industry are increasing returns, high entry costs, and strong government support, especially due to the link between the industry and the defense and military needs of governments. Many of the companies, such as the Brazilian Embraer, were initially established as government-controlled entities. Governments had an interest in producing military airplanes and developing their own aeronautics capabilities, and they only later became important in the civil aviation segment (see Niosi and Zhegu, 2010). Another important link between the civil and military sectors is represented by offset contracts used in military purchases, where buying states demand technological and commercial compensation that will also benefit the civil aircraft sector (see next section and Box 1).

An important characteristic of the industry is also the steep technological and management learning curve. Due to the complexity of the products and production equipment and the existence of many subsystems, both subject to mandatory certification (both the integrator and the suppliers have to go through many quality and safety controls), acquiring competence in the area is costly and can take many years.

## 1.2 Industry Trends

One of the most important trends of the global aeronautics industry in the last thirty years is the process of outsourcing. This movement has affected many industries, especially those working with complex products systems that are intensive in capital, engineering, and information technology (Niosi and Zhegu, 2010; Quadros et al. 2009).

The liberalization and privatization of the air transportation industry has increased fragmentation and deverticalization of supply chains. In the United States, for example, the deregulation started in 1978, increasing the competition of the airline companies and making them more cost aware, a concern later transferred to aircraft manufacturers (Horng, 2007). The cost rationalization was also fostered by the reduction of public investment in the sector, especially during the period of market liberalization (Horng, 2007). In fact, concentration, through mergers and acquisitions, was necessary but not sufficient to adapt the industry to these new and particularly demanding conditions (Niosi and Zhegu, 2010).

Outsourcing on a large scale was made possible also by the development of IT applications that allowed the modularization of components and systems, facilitating the transfer of parts of the project to sources outside the company (Quadros et al., 2009).

The outsourcing process in the aeronautics industry was a multi-step one: first, companies defined their core business and changed their strategy to strengthen it, while diminishing the attention paid to peripheral activities; then, they reduced the number of suppliers in order to diminish costs, consequently building stronger ties to the remaining ones.<sup>4</sup> This change of strategy led to a higher dependency between the system integrator and suppliers. For the same reason, this logic was repeated between suppliers and sub-suppliers (Niosi and Zhegu, 2010).

The Brazilian Embraer followed this outsourcing process after the liberalization period and its privatization, as did the European companies in the 1990s. Embraer created three levels of collaboration along the supply chain: risk partners, suppliers, and subcontractors (UNCTAD, 2003). The risk-partner strategy adopted by Embraer in 1992–1993 is today followed by the majority of the aeronautics industry, such as Boeing and Airbus (see Horng, 2007).

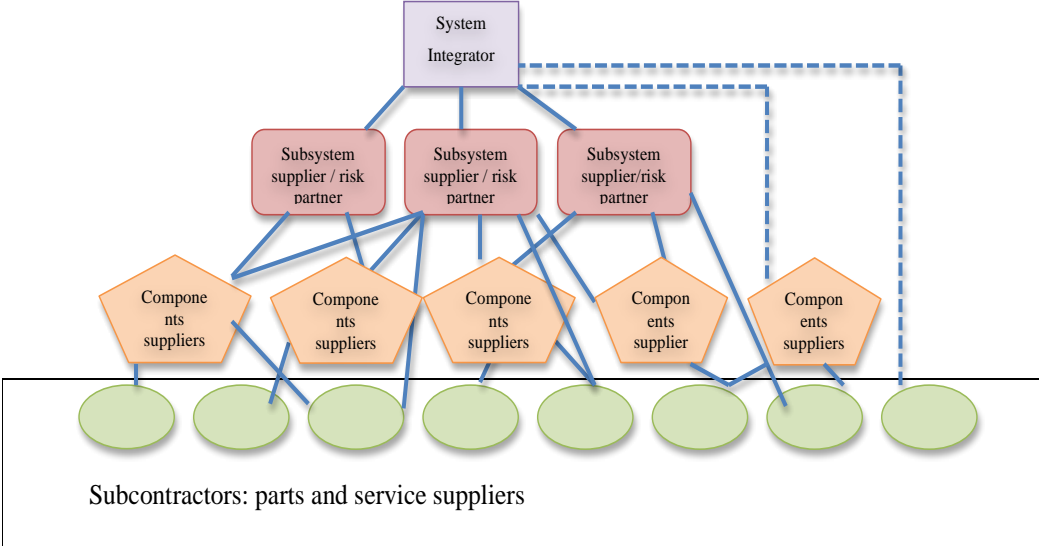
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<sup>4</sup> In the case of Boeing, for example, between 2000 and 2005, the U.S. company reduced its direct suppliers from 3,600 to 1,200. In the B787 project, the decrease was even more drastic, as the company decided to deal directly with only seven or eight first-tier suppliers (Liu, Nolan, and Zhang, 2008).

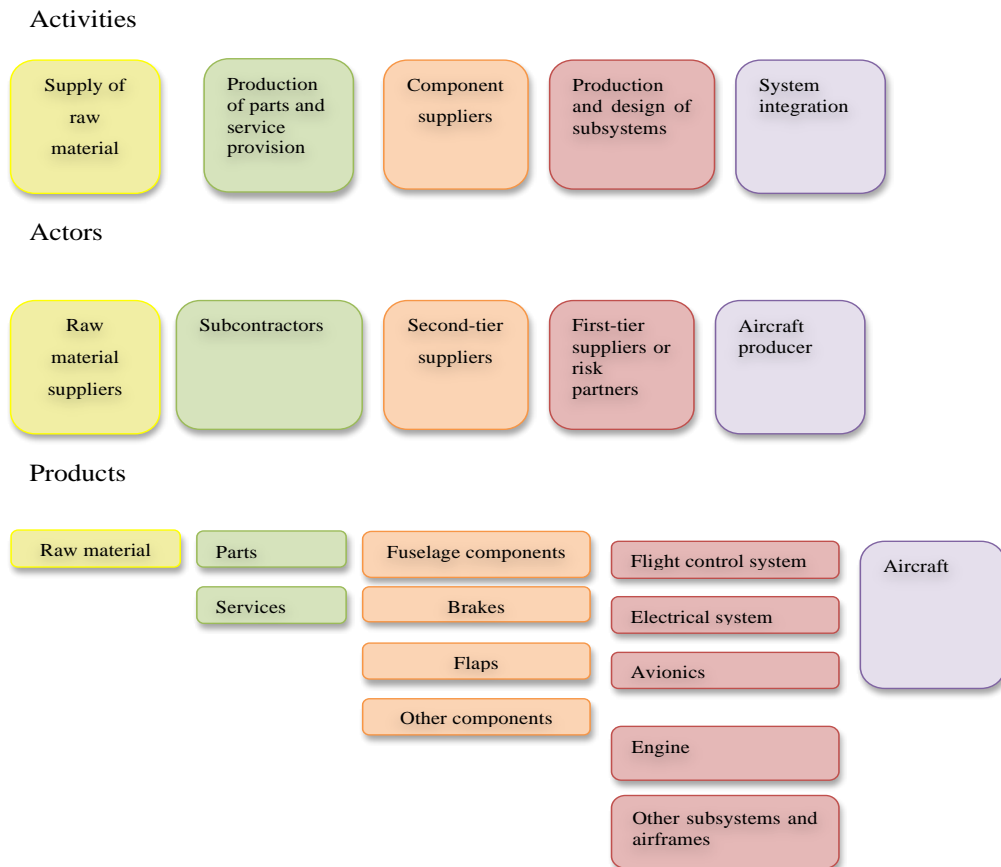
The risk partners assume the financial risk of success and participate in the co-development of a product through a bilateral contract with the MNC. The remuneration depends on the volume of sales that the product achieves. If sales are below expectations, the risk partner does not recover the entire investment made (see Horng, 2007; Bernardes and Pinho, 2002).

The outsourcing process led, therefore, to a complete restructuring of the aircraft supply chain, which is illustrated in Figure 2.

Figure 2: The Aircraft Sector Restructuring of the Supply Chain



**Figure 3: The Aircraft Sector Supply Chain**



The trend of outsourcing has also been accompanied by the internationalization of production processes, especially in the last few years of the industry. The pursuit of low costs led some original equipment manufacturers (OEMs) to countries like China, India, Mexico, Russia, and South Korea (Niosi and Zhegu, 2010). As already mentioned, it also led to a concentration process among first-tier suppliers.

Another important economic driver in the industry is the use of offsets (see Box 1). Offset agreements, also known as industrial compensations or industrial cooperation, can be defined as “any compensatory practice agreed between parties, as a condition for importation of goods or services, with the intention of generating benefits of commercial, industrial or technological nature” (Diretriz do Comando da Aeronáutica, 2005). In the last thirty years, offsets became a common practice in governmental contracts, especially in those related to aerospace and defense. The aeronautics industry is heavily affected by offset contracts. In the

United States, for example, from 1993 to 2006, more than 50% of the U.S. offsets were related to aeronautics (Niosi and Zhegu, 2010).

With offset contracts, developing countries' governments can promote new investments, knowledge spillover, and technology transfers. Also, another fundamental benefit of offsetting can be found in the opportunity that may be created for national SMEs to join GVCs, as this case study shows.

## **2. Country Industry Section**

### **2.1 The Formation of the Aeronautics Industry in Brazil**

Following World War II, the Brazilian government began to invest in the aeronautics industry through the support of public institutions, specifically in areas of research and development, with the aim of creating the basis for the construction of a national aircraft industry (ABDI, 2009). Therefore, in 1945 the Aerospace Technology Center (CTA), today called Science and Technology Department of Aeronautics (DCTA), was created, followed by (1) a school of engineering, the Aeronautical Institute of Technology (ITA); (2) a Research & Development Institute (IPD); and, in 1969, during the military regime, (3) the national aircraft industry, the Empresa Brasileira de Aeronáutica S.A. (Embraer). Embraer was established as a mixed-capital company under government control.

Being located at São José dos Campos—in the state of São Paulo—DCTA, ITA, and Embraer formed a **technology-intensive cluster**. This triple alliance constituted a very important comparative advantage in Brazil, combining the objectives of assembling airplanes and acquiring “technological autonomy” (UNCTAD, 2003).

### **2.2 The Neo-Liberal Reaction and the Privatization of Embraer**

For around two decades, the Brazilian aircraft industry had strong political and economic government support that was essential for its development, technological learning, and relative success. At the end of the 1980s, however, Brazil's economic crisis and the advancement of neo-liberal ideals led, as we may also see in the coffee sector, to significant institutional changes, which included the liberalization of trade regimes, the decrease of state



intervention in the economy, and the redefinition of the concept of national companies.<sup>5</sup> In the aeronautics sector, the main consequences of these transformations were the drastic reduction of public investment and, especially, the privatization of Embraer.

In 1994, already having significant financial difficulty, Embraer was privatized and the shares owned by the state were acquired by a consortium of local enterprises and pension funds, led by the Bozano Simonsen Group.<sup>6</sup>

During and after the period of privatization, Embraer was subject to a significant restructuring of its organization with relevant changes to its strategy, in conformity with a wider global trend. This was a determinant for Embraer to become one of the biggest commercial aircraft manufacturers in the world (see Table 1).

### **2.3 Embraer's Strategy: The New SMEs and the Risk Partner**

Embraer's new strategy, after its privatization and market liberalization, was based on **system integration**. The focus moved to combining and adapting subsystems, according to the necessities of the projects, in particular of becoming an aircraft system integrator. The main strategies to achieve these goals were outsourcing, internationalization of investments, and focus of its skills.

From these new strategies, three modifications of the supply chain followed:

**(1) The creation of a new group of SMEs, which would become Embraer's subcontractors; (2) the adoption of risk partners by Embraer, as mentioned above; and (3) the increase in the number of risk partners with the consequent reduction of first-tier suppliers** (see Table 3).

(1) First, new national SMEs were created to function as subcontractors. Predominantly, these have been owned by former Embraer employees—dismissed during the organizational restructuring—and have supplied products, process, or services, such as machined parts, printed pieces, and composite material (see Bernardes and Pinho, 2002).

These new companies were mainly micro or small,<sup>7</sup> family-run, and characterized by fragilities that pervaded the economic, financial, technological, administrative, and market dimensions. These fragilities are one of the main obstacles to their growth, both in the internal

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<sup>5</sup> The liberalization of trade regimes has allowed Brazilian companies to trade with international suppliers without restrictions. In other words, the decision of contracting has been conferred to the buyer—Embraer. In addition, the *Emenda Constitucional* (EC) n. 6/1995 has provided that the government cannot treat differently the Brazilian company with national capital and the Brazilian company with international capital.

<sup>6</sup> In 1994, Embraer debts were approximately USD 1 billion.

<sup>7</sup> The classification is based on income, according to the BNDES proposal (Quadros et al., 2009).

and external market (Quadros et al., 2009).

The relationships between Embraer and its subcontractors have unique characteristics that resemble outsourcing. In most cases, Embraer provides its subcontractors with the required raw material, mold, specifications, and design. Subcontractors charge on an employee-hour or machine-hour basis and undertake activities such as machining, printing, and parts assemblage. In these cases, however, Embraer is responsible for completing the final stages of surface treatment and subsystem assemblage.

Embraer is also responsible for the capacitation of most of its subcontractors. In this case, Embraer's engineers disseminate company knowledge by training SMEs' employees and management, monitoring the technical production, and promoting learning processes (Bernardes and Pinho, 2002).

It is important to mention that the commercial and technological flow between the subcontractors and Embraer represents only a small fraction of the added value that is created in the relationships that Embraer has with its risk partners and international component suppliers. It is, as mentioned by Quadros et al., a very distinct kind (and less beneficial) of supply-chain insertion and interaction with Embraer (Quadros et al., 2009).

Subcontractors, moreover, are traditionally highly dependent on Embraer. For some of them, 90% of their revenues come, or used to come, from the relationship with the anchor-enterprise. This dependency generates great vulnerability for these companies.

From the characteristics of this relationship, such as the significant participation of Embraer in qualifying its subcontractors, in controlling its production, in providing the complementary activities (such as design, raw material purchasing, etc.), and the high degree of dependence of these SMEs, we can affirm that the governance model that characterizes their relationship can be described as predominantly *captive*,<sup>8</sup> according to the classification of Gereffi, Humphrey, and Sturgeon, 2005; see also Quadros et al., 2009).

(2) Second, Embraer originally adopted the strategy of risk partnership. Risk partnership combines risk-sharing and co-financing, providing incentives for cooperation not only in the production process but also at the marketing stage.

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<sup>8</sup> As affirmed by Gereffi, Humphrey, and Sturgeon (2005), the captive type of GVC governance occur when the product complexity and the ability to codify are high, but the suppliers' capabilities are low. The typical situations concern the small suppliers' dependents of big clients. The lead firm must invest in the capacitation and control of the supplier, encouraging the development of transnational dependence, with the aim to lock-in the supplier and exclude others from reaping the benefits of their efforts. Therefore, the suppliers face significant switching costs and are "captive." It happens, in general, through confining the supplier to a narrow range of tasks (such as assembling), and making them dependent on the lead firm for complementary activities (such as design, raw material purchasing etc.) (Gereffi, Humphrey, and Sturgeon, 2005).

Embraer adopted the risk-partner model first with the ERJ 145 project, in which some subsystems were being developed and supplied by risk partners, and others by Embraer itself. The model was originally adopted mainly because of the financial benefits of sharing risks with other partners. Absent risk-sharing, Embraer would not have had sufficient capital to fund the project and its development (UNCTAD, 2003).

The risk partners participate in the development of the product in an integrated manner with Embraer, assuming responsibility for the development of their respective subsystems and collaborating in the definition of their interfaces with the airplane architecture. They are responsible for the financial investment, engineering, and provision of tools and equipment needed to produce the prototypes and also for the certification process of their subsystem (Quadros et al., 2009).

The period for the development, tests, and certification of a new subsystem is approximately five years. Therefore, the compensation of risk partners will start to accrue only after this period and is linked to the success of aircraft sales. The remuneration of their investment only begins when, and if, the airplanes are sold.

If sales are below expectations, the risk partner does not recover the entire investment made (see Horng, 2007 and Bernardes and Pinho, 2002). However, if the sales exceed expectations, the risk partner not only receives the entire return of its initial investment but also part of the sales profit, and it also has the exclusivity for the sale, maintenance, and replacement of its products for all the airplanes made within the program (Santiago, 2002). With this exclusivity, risk partners also acquire important bargaining power in their relation with Embraer.

Regarding know-how and technological transfer, there is a significant exchange between the actors. There is evidence that it was specifically the transfer of know-how from Embraer that allowed many of its first risk partners to acquire the necessary abilities to become, from a supplier status, subsystem integrators, and also to access other GVCs in the same position (Bernardes and Pinho, 2002; Quadros et al., 2009).<sup>9</sup>

Each risk partner is linked through a bilateral contract, but the interdependence among the risk partners is relatively high.

In the risk partnership, therefore, due to the high capacity of Embraer's risk partners, the complex interactions between the firms and the intensive exchange of tacit knowledge and

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<sup>9</sup>This was the case, for example, of Parker Hannifin, Hamilton Sundstrand, Eleb, Gamesa, and Kawasaki.

their mutual dependence, among other factors, the predominant governance mode of the GVC can be characterized mainly as one of the *relational* type.<sup>10</sup>

In none of Embraer's projects, however, have Brazilian local companies been selected as risk partners (see next section). Due to the amount of investment needed, the risk involved, the long-term return, and the technological capacities and abilities required, risk partners are mainly MNCs with high financial capabilities. In fact, the main criteria normally used by Embraer to select its risk partners are: (1) technological competence; (2) subsystem integration capacity; and (3) investment capacity.

Although they are all foreign, the necessity of some joint activities for the development and production of subsystems induced some risk partners to create production unities or representation offices close to Embraer's factory, giving rise to the cluster. This happened, for example, with C&D, Sobraer, Latécoère, Pesola, Hamilton Sundstrand, Honeywell, and Parker Hannifin. However, it is important to mention that, in general, the unities created are small factories or only representative offices and have not yet received sufficient investments to become global production bases (Lima et al., 2005).<sup>11</sup>

(3) Embraer's suppliers are mostly international enterprises with high capabilities and no production unities in Brazil. They, contrary to risk partners, do not participate in the airplane development process, or in the financing of the program (therefore they do not share any direct risk), but rather supply raw material, components, or subsystems directly to Embraer, assuming the responsibilities for the competences related to the production technologies. They receive Embraer's specifications but, differently from the subcontractors, they are responsible for articulating the purchase of raw material and other components, and assembling and delivering a final product, with the costs already aggregated in the final

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<sup>10</sup> As affirmed by Gereffi, Humphrey, and Sturgeon (2005), relational GVC governance occurs when product specifications are difficult to codify, transactions are complex, and supplier capabilities are high. There is a strong exchange of tacit knowledge between buyers and sellers, which are, in general, governed by a high level of explicit coordination. Furthermore, the high capacity of the suppliers provides a strong motivation for buyers to outsource so they can gain access to complementary competencies (Gereffi, Humphrey, and Sturgeon, 2005).

<sup>11</sup> According to research undertaken by Quadros et al. (2009), the majority of risk partners do not intend to locate activities of manufacturing or assembling in Brazil, whether for strategic reasons (maintenance of skills in a strategic matrix), or because of the small regional market in Latin America, which, according to the research, is not considered to be compatible with the economic scale of the operation (Quadros et al., 2009).

product.<sup>12</sup> Contrary to risk partners, their income is tied to the supply of a product, and does not depend directly on airplane sales.<sup>13</sup>

Their relationship with Embraer can be, therefore, best described as modular ( See also Quadros et al., 2009).<sup>14</sup>

After the success of the ERJ 145 project, Embraer decided to expand the number of risk partners and reduce the number of suppliers, increasing the level of delegation and fostering the development of the remaining ones to become system integrators.

In fact, while in the ERJ 145 project, only the producers of avionics and turbines were responsible for the supply of a complete subsystem; in the ERJ 170/190 project, this has been extended to several other subsystems such as hydraulics, air-conditioning, energy, etc.

It is also important to note that if, on one hand, this strategy has generated important technological, financial, and commercial gains, on the other, it constitutes a network of bilateral monopolies reducing Embraer's market power (ABDI, 2009).

## 2.4 The Consequences of the Risk-Partner Expansion

For some of Embraer's suppliers, the new strategy of expanding the number of risk partners was a great opportunity. A large number of them grew inside the global value chain, from components or single subsystem suppliers to subsystem integrators. The partnership with Embraer helped them to acquire the new necessary competences **and, ultimately, to become subsystem suppliers in other GVCs** as well (Quadros et al., 2009; Bernardes and Pinho, 2002).

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<sup>12</sup> Another important difference between suppliers and subcontractors regards the value of the supplied product. While subcontractors make, in general, small parts of low economic or technological value, which will be part of the more complex components or subsystems, the supplier delivers a product that is "ready," with a higher added value, which generally demands higher competencies (Quadros et al., 2009).

<sup>13</sup> While risk partners have to wait until a plane is sold to receive their share from it, suppliers are paid right after the product is supplied (generally, seventy-five days after product receipt for exclusivity contracts, or between thirty and ninety days in cases where the contract has a one-to-three-year duration) (ABDI, 2009).

<sup>14</sup> As affirmed by Gereffi, Humphrey, and Sturgeon (2005), the suppliers in modular value chains are typically characterized by making products according to a customer's specifications, by taking full responsibility for competencies surrounding the technology process, by using generic machinery that limits transaction-specific investments, and by making capital outlays for components and materials on behalf of customers (Gereffi, Humphrey, and Sturgeon, 2005). This type of GVG can occur, according to the authors, "when product architecture is modular and technical standards simplify interactions by reducing component variation and by unifying component, product, and process specifications, and also when suppliers have the competence to supply full packages and modules, which internalizes hard to codify (tacit) information, reduces asset specificity and therefore a buyer's need for direct monitoring and control" (Gereffi, Humphrey, and Sturgeon, 2005).

However, due to the amount of investment needed, the risk involved, the time delay for revenues, and the technological capabilities required to select risk partners, risk partner increase occurs only among enterprises with strong financial and technological capacities. These prerequisites, according to the ABDI, practically exclude any national producer from the list of Embraer's risk partners (ABDI, 2009).

Brazilian SMEs are characterized by (1) low technological capacity; (2) limited production scale; and, especially, (3) small financial resources (ABDI, 2009). Most of them, at least individually, **do not have the technological or administrative capacity to perform the series of activities involved in being a subsystem integrator** (such as the purchase of raw material and the management of the operational actives—which includes the assembling of parts, components, and subsystems; the surface treatment; and the logistical planning to deliver the product) (Quadros et al., 2009; Bernardes and Pinho, 2002).

The acquisition of the raw material, for example, is already a major problem for most SMEs. The large majority of them, on an individual basis, do not possess either the scale or purchasing power to negotiate its purchase and importation.

For the Brazilian SMEs, the expansion of Embraer's risk-partner strategy, more than constituting an opportunity, became a risk. By integrating their tasks at the second level, Embraer was pushing SMEs to contract with the subsystem integrators instead of contracting directly with Embraer.

In response, Brazilian SMEs are adopting strategies to allow them to grow within the Embraer value chain and also to access new GVCs. These strategies comprise both the possibilities of growing individually, through mergers, acquisitions, and investments based in one single firm, but also through associative forms, that would work as an intermediary between the several SMEs and the MNC. In fact, an associative form could allow the SMEs to accumulate different competences that they did not have individually, which could permit them to fulfill the requirements to become subsystem suppliers and maybe even risk partners (Quadros et al., 2009).

A significant example of the creation of a new intermediary to facilitate the access of the Brazilian SMEs to the aeronautics sector in new GVCs is High Technology Aeronautics (HTA), an export consortium created by SMEs of the sector, traditionally subcontractors of Embraer.

It is important to mention that the creation of new intermediaries in the sector, as well as the support of the individual growth strategy, has also been the result of public policies and

agencies' efforts, among which are Apex and the BNDES. They have promoted different types of private-public partnerships with firms, and between firms and private intermediaries.

**a) Apex-Brasil—Brazilian Trade and Investment Promotion Agency (Agência Brasileira de Promoção e Exportação de Investimentos)**

Apex-Brasil is a private agency with public functions under the supervision of the Ministry of Development, Industry, and Foreign Trade (MDIC) (see Figure 4), created to (1) promote exports of Brazilian products and services; (2) contribute to the internationalization of Brazilian companies; and (3) attract foreign investment to Brazil (Apex-Brasil website). Its actions are funded by the federal government and its deliberative council is composed of four members indicated by public institutions and three indicated by private institutions.

Its role is of great importance both to the aeronautics and the coffee sectors. In respect of the first, it fostered the creation of the HTA through the exporting consortia program (Consórcio de Exportação), and currently in both sectors it promotes the insertion of Brazilian SMEs into the international market with the Projetos Setoriais Integrados, or PSI (Integrated Sectorial Project) program.

The exporting consortia program was created in 1999 with the aim of “sustainably [promoting the] increase of the Brazilian exports, improving the exporting capacity of SMEs, increasing the number of new exporting companies and creating conditions for a cultural change in the development of companies' strategic plans” (Apex-Brasil Consórcio de Exportação project, 1999).

Interested enterprises had to elaborate and present a project. Once the project was approved, Apex-Brasil would support the consortium through three phases: (1) the definition of composition (with activities of evaluation and selection of the firms); (2) the creation (legal and administrative activities for the formation of the consortium); and (3) the maintenance (activities to consolidate and strengthen the consortiums, with a focus on actions to improve export supply and export promotion activities). Once all of the requisites were met, Apex-Brasil would financially support the consortium to export for the first three years (in general, Apex-Brasil would enter with R\$ 1 for each R\$ 1 invested by the SMEs), and then, for each additional year, a separate plan was required to be sent for additional financial approval.

The HTA was formed within this project.

Although the export consortia program has had success cases, Apex-Brasil decided to cancel that program in 2008 and continue just with the other program, the PSI.

This program foresees a technical and financial partnership between the governmental agency and a sectorial representative association: the CECOMPI (Competitiveness and Innovation Center of the Northeast Region of São Paulo State), for the PSI “Brazilian Aerospace Cluster” in the case of the aeronautics industry; and the BSCA (Brazilian Specialty Coffee Association) for the PSI “Brazilian Coffees—Special Beans” in the case of the differentiated coffee sector.

The PSI—which currently constitutes Apex-Brasil’s main program, reaching around eighty sectors of the Brazilian economy—has as its main goal the strengthening of Brazilian productive sectors in the international market through a range of actions, oriented mainly to the promotion of exports, positioning of the SMEs in the external market, image building, and internationalization and commercial intelligence management, as well as support for participating in international fairs (Apex-Brasil website).

The first CECOMPI—Apex-Brasil partnership was created in 2009 with the aim of developing “the commercial promotion of the ‘Brazilian Aerospace Cluster’ through the competitive insertion of the aeronautic supply chain’s firms and the increase of their capacity to export and the diversification of their products”. Due to its success, the partnership was renewed in 2011, having as its new goals the generation of new cases of exporting firms, the increase of their capabilities, the offering of structured packages and integrated services of export promotion, and the fostering of collaborative networks.

Apex-Brasil and the sector association play a complementary role. It is up to the national agency to draw the strategies of international insertion and of promoting Brazilian products and services in the international markets. On the other hand, it is up to the association to identify the SMEs able to participate in the program and enable them to become exporters (Caixeta, Galuppo, and Netz, 2006).

All these activities can count on Apex-Brasil’s technical and financial support. The national agency enters with around 50% of the necessary expenses for the development of the program.<sup>15</sup>

One of the main characteristics of this program is its sectorial approach, with the aim of beneficiating all the companies of the sector in the state, region, or entire country and not, unlike the exporting consortium project, only a selected group of firms. The program has an initial term of two years, with the possibility of renewal.

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<sup>15</sup> In the first PSI with CECOMPI (2009–2010), Apex-Brasil entered with R\$ 837,109.33 and the association and its members entered with R\$ 875,333.72. For the second phase of the program (2011–2012), Apex-Brasil will make an investment of R\$ 2,400,000, and CECOMPI and its members R\$ 2,416,687.7.



Beyond those two main programs, Apex-Brasil also has another project related to the aeronautics sector: the National Investment Program for the Aeronautic Sector (Programa Nacional para Atração de Investimentos para o Setor Aeronáutico) (see Box 2).

**b) The BNDES—National Bank of Economic and Social Development (Banco Nacional do Desenvolvimento Econômico e Social)**

The BNDES is a federal government wholly-owned company supervised by the MDIC (see Figure 4). It has been the main Brazilian long-term financial bank since its foundation in 1952, investing in all segments of the economy, within a policy that includes social, regional, and environmental dimensions (BNDES website).<sup>16</sup>

**The role of the BNDES in the aeronautics sector** has been significant in the last decades.

For a long period, BNDES actions in this sector were restricted to supporting Embraer after its privatization, both in financing the development of the company's new airplane programs, and, especially, in aiding the insertion of Embraer's new products in the market through export finance mechanisms (Exim). Around 2004, however, BNDES started to change its policy, with a new focus on the development and densification of the national supply chain.<sup>17</sup>

Within this new policy, the BNDES decided to (1) pursue a higher commitment of Embraer in increasing the local content on its airplanes; and (2) develop a new program specifically for the SMEs of the sector, with the aim of strengthening and densifying the supply chain of the aeronautics industry established in Brazil.

The strategy of encouraging **Embraer to adopt higher percentage of local content in its products led to Embraer's adoption of the PEIAB—Expansion Program of the Brazilian Aeronautic Industry (Programa de Expansão da Indústria Aeronáutica Brasileira).**

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<sup>16</sup> The BNDES (holding) has three wholly owned subsidiaries: FINAME, BNDESPAR, and BNDES Limited. Together, the four companies are called the “BNDES System” and has as its main goal to “promote the sustainable and competitive development of the Brazilian economy, with job generation and reduction of social and regional inequalities.” The BNDES has an important role in different sectors of the economy. In fact, in both case studies, the analyzed companies used either its programs or its lines of credit.

<sup>17</sup> Actually, the national bank was increasingly unsatisfied with the mismatch between the volume invested in Embraer and the benefits of this investment to the sector as a whole and to the development of the national supply chain. Due to the origins of Embraer's investment resource (the compulsory *Fundo de Amparo ao Trabalhador*—FAT—“Workers' Support Fund”), the BNDES may take into consideration in its investment policy the local value generation and job creation and also the presence of minimal level of local content, even though this is not imposed in a rigid manner. In fact, the investments made in Embraer were accompanied neither by the expected level of national content in its products, nor by significant job generation in the country.

The adoption of the PEIAB was also a result of the successive contestation made by Bombardier within a WTO dispute in which BNDES support of the Brazilian company was questioned (see Box 3).<sup>18</sup> The program comprised three sets of actions, which had the objective of increasing the national content of airplane parts—perceived as the increase of inputs that receive some kind of local industrial treatment or transformation and not as a technological program intended for established national suppliers (Cassiolati et al., 2003): (1) stimulus to foreign partners to create factories in Brazil; (2) stimulus to foreign partners to close more deals with Embraer’s Brazilian suppliers; and (3) the development of technology with federal and local government entities that was not available in the country (Bernades and Pinho, 2002).

Complementing this program, and always linked to the incentive policies of BNDES, Embraer, in 2004–2005, elected national content in the supplied products as one of its decisive criteria for choosing its risk partners or suppliers in the new Phenom program. It was exactly within this context that Pratt & Whitney, interested in supplying the engines for the Phenom, concluded its contract with Grauna.

The second goal of this new policy was the creation of an innovative program: the Pro-Aeronáutica. Using different credit lines of BNDES, the program aimed to offer long-term financing to support investments to be made by SMEs of the Brazilian aeronautics supply chain, looking for the densification of the national production chain (see Box 4).

The first step in accomplishing this objective was the creation of the seminar entitled “Densification of the Production Chain,” which had the aim of amplifying the efficiency in the conception, design, and implementation of the BNDES supporting operational politics to this important and dynamic sector of the Brazilian economy (BNDES website).<sup>19</sup>

It is important to mention that, according to BNDES, one of the main conclusions of the seminar was that the Brazilian companies in the sector, individually, were too small to grow within Embraer’s GVC or to access a new GVC, so it was crucial for them to combine forces. Therefore, for the development and strengthening of national SMEs, it was necessary to go through a consolidation process that would allow access to credit in order to get the necessary investments for their modernization (Migon, Montoro, and Pinto, 2007). The

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<sup>18</sup> As Bernades and Pinho (2002) affirm, “after the successive contestation from Bombardier and due to BNDES stimulation, Embraer tried to reverse its conduct of excessive foreign supply, implementing a new policy of densification of the national supply chain” (Bernades and Pinho, 2002).

<sup>19</sup> The seminar was just the first step of a long process that included the creation of the Programa Conjunto para ampliar o Adensamento da Cadeia Produtiva Aeronáutica with the participation of ANAC, AIAB, and MDIC in 2006, the creation of the Estudo Prospectivo Setorial for the aeronautic sector in 2007, and, finally, in 2008, the creation of an exclusive program for the entire aeronautic sector: the Pro-Aeronáutica.

consolidation could be made both through associative forms (such as the consortium HTA) or via integration.

These conclusions influenced other actions of the BNDES and of its subsidiaries, such as the BNDESPAR. It was within this context that Grauna merged with two other companies in the sector and received the investments of the BNDESPAR.

However, according to BNDES, one of the most important results of the bank's efforts and of the Pro-Aeronáutica program was the creation of a conscience about the necessity to support the national supply chain, bringing the whole sector into the priorities of the government. In fact, the new industrial policy of 2008 PDP (Productive Development Policy) that substituted the former PITCE (The Industrial, Technological, and Foreign Trade Policy) (see Box 5), influenced by the BNDES's new policy and efforts, included the aeronautics sector as a priority and predicted the creation of a specific Productive Development Policy for the sector, the **PDP—Aeronautics Industry** (see Box 6).

This specific industrial policy established, after a review in 2009, five goals to be achieved in the aeronautics sector: (1) maintaining the third position in the global market of commercial airplanes; (2) doubling the global participation in executive airplanes until 2015; (3) consolidating Brazil as a center of production and maintenance of helicopters for/in South America; (4) developing national suppliers with a global reach; and (5) increasing the export of parts, structures, and aeronautics systems.

Therefore, it is possible to see two prongs that were adopted by the new Brazilian policy: maintaining the leader company (Embraer), but also, within BNDES's perspective and efforts, supporting SMEs of the sector and the densification of the supply chain.

### **3. Firm and linkages section—Grauna and HTA**

#### **3.1 Background: Formation and Dependence on Embraer**

Grauna Aerospace S.A. (Grauna) is a Brazilian corporation not listed on the stock exchange. It specializes in assembling Computer Numerical Control (CNC) machining services and parts, and the production of components (especially of turbines) for the aerospace sector. It was created in 1990 as a limited partnership (Grauna Usinagem Ltda.) and merged in April 2005 with two other companies of the sector (Spu Indústria de Peças Ltda. and Bronzeana Usinagem Ltda.) and a venture capital group (Stratus). After merging, it became Grauna Aerospace S.A., one of the leading national firms in parts and components for the aerospace

industry, with two plants in Caçapava and Botucatu (both in the state of São Paulo). It offers around five thousand different items and has a production capacity of fourteen thousand pieces/month (Grauna website).

As is the case with most of Brazil's local firms of the sector, Grauna was originally established by ex-employees of Embraer. The restructuring of Embraer's organization led to the loss of a large number of employees, and some of them, as was the case with the owners of Grauna and Alltec, decided to create new local firms. They provide services and supply products formerly produced inside Embraer.

As a result, Grauna, like most of these companies, had, for many years, participated almost exclusively in Embraer's supply chain with governance that could be described as *captive*.

### **3.1.1 Contractual Practices between Embraer and Grauna**

Embraer has two means to subcontract SMEs: internal and external. In internal subcontracting, the SMEs provide goods, services, and workers inside Embraer's physical plant. In external subcontracting, the SME's production is performed outside Embraer's plant (Bernardes and Pinho, 2002).

Grauna is an **external subcontractor** of Embraer. In this case, Embraer supplies the raw material and the design, while Grauna executes the industrial transformation (parts).

This production chain is based on delivered lots of products or engineer services measured by the numbers of workers and hours worked (Bernardes and Pinho, 2002).

The producer-supplier relationship between Embraer and the SMEs is essentially centralized and vertical. Embraer basically trained SMEs to produce goods and services according to the quality standards that are technically required (Bernardes and Pinho, 2002).

From 1990 until 2003, Grauna and Embraer didn't have a written contract. All of their relationships were oral. Oral contracts were embedded into a long-term cooperative and self-sustained relationship.

It is important to mention that the lack of a long-term written contract between Embraer and its subcontractors was recognized by BNDES as a significant problem for Brazilian SMEs. Long-term written contracts would allow the subcontractors to have better predictability of their business activities and to plan long-term investments. This would also involve the possibility of using the contract as a guarantee for credit operations, such as the one provided by the BNDES. In fact, the BNDES made an effort through the Pro-Aeronáutica

program to foster the signing of written contracts between Embraer and the Brazilian SMEs (BNDES interview).<sup>20</sup>

After many years of Grauna's insistence, the SME and Embraer finally formalized their relationship through a written contract of "services of industrialization." The contract is a long-term agreement with a duration of five years that will be executed through different purchase orders.

This mechanism, however, gives no guarantee of an effective order to Grauna. There is a forecast (future demand estimate) of a year and a half, but Embraer does not guarantee purchases, preventing SMEs from making safe planning of future activities.

Moreover, Embraer, through confidentiality clauses, forbids the use of its contracts as guarantees for loans, making it more difficult for its subcontractors to obtain access to the BNDES financing programs.<sup>21</sup> In the same way, Embraer does not guarantee Grauna's exclusivity for the product supplied (nor to any of its subcontractors) and protects its product design through the use of intellectual property rights. As a consequence, Grauna cannot use the same product design in contractual relationships with other clients; they are allowed, however, to use new technology that may be eventually acquired to produce new products for other clients.

Regarding dispute resolution, the contract usually provides a clause for arbitration in case of breach. However, disputes are mainly solved by informal mechanisms. The main reason for this is not related to the diffidence or problematic nature of the Brazilian or other legal systems, but to the intention to avoid formal disputes. A dispute would harm their commercial relationship, which diminishes the interest, especially on the SMEs side, of entering into a formal dispute. From the terms of the contract it is possible to see the disparity of power in the relation between the companies.

Another important point in the contract is Embraer's requirement that Grauna and all of its suppliers receive certification for quality management system—ISO 9000 and NBR 15.100 (specific to the aeronautics sector)<sup>22</sup>—and its own certification.

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<sup>20</sup> The BNDES established that to obtain financing through the Pro-Aeronáutica program, the bank analyst should have access to a written contract between the SMEs and Embraer (or other MNC) (BNDES interview).

<sup>21</sup> The contract also defines the terms of the delivery, quality criteria, and penalties regarding any delay or quality problems which might arise, among other issues.

<sup>22</sup> ISO 9001 is a generic certification of the Quality Management System that is part of the ISO 9000 family. NBR 15.100 (Brazilian version of AS 9100), on the other hand, is an international quality management system certification elaborated specifically for the aircraft industry. The NBR 15.100 complements ISO 9000 requirements by adding provisions that address both civil and military aerospace specifications.

In fact, the compliance with ISO and other standards (concerning both safety and quality) has become a prerequisite in the aeronautics sector for enterprises to access and remain in the market.

In Grauna's case, although it was Embraer that initially required the certifications, the SME agreed, as they were aware of its importance to also access other GVCs, especially in the international market. It is becoming more common for SMEs to acquire certification independently. According to a survey (Quadros et al., 2009), while 83% of the national SMEs of the aeronautics sector affirmed that Embraer's requirement is a reason for acquiring certification, around 37% affirmed that their motivations in being certified are self-interested because it may operate as a "business card" for new clients; 23% mentioned the aim to export as a reason for acquiring certification. Certification can be considered fundamental to the SMEs' access to new GVCs (Quadros et al., 2009).

A very interesting point in this sense is Grauna's experience in relation to Pratt & Whitney's certification. According to the SME, the certification opened new market opportunities to the company. Pratt & Whitney's certification gave Grauna an edge and generated a considerable increase in its reputation once other MNCs knew they could trust Grauna's production system.

Another interesting case is the company Lanmar, another one of Embraer's subcontractors. Lanmar claims that after obtaining the ISO 9001 and NBR 15100 certifications, its access to new GVCs was easier. According to the company, after being certified it managed to sign new contracts, leading to access to other GVCs in aeronautics as well as in other sectors, such as textiles and automobiles, diminishing considerably its dependency on Embraer.<sup>23</sup>

However, if on the one hand the certifications are a fundamental factor in Brazilian companies capabilities to access new GVCs, on the other hand it is necessary to highlight that the implementation costs of quality management system (as the ISO 9001 and the NBR 15100) are high, and significant to the SMEs. In fact they usually pay not only the

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<sup>23</sup> According to the company's declaration, "When we started to get certified, still during the ISO 9002's period, our main client was Embraer. When we became certified, soon other big companies from the auto and textile industries showed interest, which, consequently, meant a wide range of new customers" (our translation). In the case of NBR 15100 certification, it represented a big differential for the company in the aeronautic market, "a step ahead of the competition," and it has also "opened doors" in the international market. For instance, certification played an important role in a contract with Boeing through the intermediation of Embraer (Brazilian Aerospace Cluster, 2011).

certification costs but also the costs associated with maintenance and internal audits by themselves.<sup>24</sup>

In this sense, it is possible to affirm that the policies to support the costs of certification would be very important.<sup>25</sup> However, in Brazil, it isn't possible to identify an effective governmental support to this extent. In fact, initiatives such as the ones from BNDES (which predicts the possibility of financing the costs of certification through the Pro-Aeronáutica program and with the "BNDES Card") are hard to access. The only effective program that addresses some of these concerns is the one from Apex-Brasil, which through the export consortia program with the HTA, paid 50% of the cost of certifying the member companies of the consortia.

### **3.1.2 Power Allocation and Strategies of Access to New GVCs**

From the terms of the contract, it is possible to assess the power disparity in the relationship between Embraer and Grauna, which is unevenly distributed. When any irregularity related to term criteria, quality, price, or market fluctuation occurs, Embraer can unilaterally suspend the purchase of goods or services supplied by SMEs (Bernardes and Pinho, 2002). Termination power is unilaterally conferred to the MNC, and the SMEs economic dependence makes bargaining difficult.

From these terms, it follows that the SMEs' conditions as Embraer's subcontractors are very unstable and insecure. These conditions, added to Embraer's new strategy of risk partners (which, as already mentioned, represents a risk to the maintenance of SMEs as Embraer's subcontractors or suppliers), have pushed these companies to develop new strategies to access alternative GVCs outside of Brazil and climb Embraer's value chain to become its supplier or even a risk-sharing partner. Grauna is a case in point.

As diagnosed by BNDES, Grauna, like most Embraer subcontractors, was too small and did not have all the economical capacities and technological capabilities required to access new GVCs or to climb Embraer's value chain. Being well aware of its limits, Grauna

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<sup>24</sup> According to Grauna, the cost of being certified (ISO or NBR) is around 100 thousand Brazilian Reais, while the maintenance and internal audit costs are around fifty thousand Brazilian Reais/year. As for MNC's own certifications, the SMEs should bear the costs of all modifications necessary to adapt its production process to the MNC's specific requirements. However, the MNCs do not charge for the certification or to certify the SMEs.

<sup>25</sup> It is important to mention that Brazil has always been concerned with having its own certification agency in line with leading international certification bodies. An important step in this direction occurred in 1975 when Brazil and the United States signed a bilateral agreement that provided for mutual recognition of certification procedures of both certification agencies. Later, a similar agreement was signed with EASA (European Aviation Safety Agency). An important example of such efforts is the product certification of Embraer's regional jet ERJ 170, which occurred simultaneously at the FAA, EASA/JAA and the Brazilian Agency (Oliveira, 2005).

started a growth path based on two parallel strategies: via integration and via networks. In both ways, the support of BNDES and Apex-Brasil played a key role.

These growth paths led Grauna to successfully access new GVCs, decreasing its dependence on Embraer in two different ways: (1) directly and (2) through an intermediary, the HTA.

### **3.2 Access to New GVCs: Direct Access**

Grauna successfully obtained direct access to Pratt & Whitney's GVC as a supplier of turbine components through a strategy based on the growth of the firm via integration and deep investments. Many factors were critical for the achievement of this goal, such as the adoption by Embraer of the PEIAB program and the local content requests for the Phenom project; the merger with other companies of the sector and a venture capital group; the support and guidance of the BNDES; and participation in the BNDESPAR program.

In 2004, as a result of the above-mentioned BNDES efforts, Embraer, in accordance with its PEIAB program (Expansion Program of the Brazilian Aerospace Industry), established that **to become one of its suppliers in the new Phenom program, it was recommended that the enterprise had its products made also with the parts, components, or services provided by Embraer's Brazilian suppliers/subcontractors.**

This choice played a key role for the insertion of Grauna in the Pratt & Whitney supply chain. Pratt & Whitney, an MNC specialized in the production of turbines, and with the intention of becoming Embraer's supplier in the Phenom program, started sending representatives to Brazil to find a national company that could supply them with turbine components, and, therefore, increase their chances of being selected by Embraer.

It is interesting to mention that the first contact between Pratt and Grauna was through HTA. Pratt & Whitney initially approached the consortium of SMEs, but then decided to conclude business directly with Grauna.

Alone, however, Grauna, was too small to have enough financial and structural capacity to produce such components. Therefore, in 2005, Grauna merged with two other enterprises of the sector (Spu and Bonzana) and a venture capital group (Stratus). The merger was the means by which Grauna chose to increase their production scale, their financial structure, and technological investment capacity, and was an approach which ultimately allowed them to capacitate themselves, both technologically and structurally, for the production of technical value components.



According to Grauna, BNDES was one of the motivators of this choice. As already mentioned, the development bank strongly believed that the strength of the SMEs could be reached mainly by a consolidation process in the sector, which, by strengthening the SMEs' balance sheets, would allow for and facilitate the access to credit that would provide the substantial investment required for the upgrade and expansion of the SMEs' industrial park (Migon, Montoro, and Pinto, 2007).

Therefore, according to the BNDES, the first step for the growth of the SMEs of the sector should be a consolidation, and the second step should be the attraction of venture capital. Both strategies were adopted by Grauna with the support of the development bank. Another growth path supported by the BNDES is the establishment of a partnership or joint venture with foreign firms, a strategy adopted, for example, by Thyssenkrupp Autômata in the same period (Migon, Montoro, and Pinto, 2007).

Another important indication concerned the business model of the company. According to BNDES, the adoption of a corporation structure with a more professional administration was strongly recommended. One of the major difficulties faced by the SMEs in participating in financing programs, besides the guarantees—which is the most complicated issue—is related to a nonprofessional family management structure, and the consequent incapacity to present appropriate business plans and financial statements.

Therefore, with the merger, Grauna adopted a new corporate structure: the *sociedade anônima* (corporation), with a significant change in Grauna's governance. This type of business organization requires the publication of the corporation's financial statements, shareholder's meetings and allows for the organization of a more sophisticated management structure, with a supervision body and board of directors. Prior to the Brazilian Civil Code reform, these requirements were not present in the structure of a Limited Liability Company (see Table 4).

It is important to mention that Brazil previously had a public company (CELMA) that produced turbines. It was, however, privatized in 1991, and after the restructuring of the business, as a result of which GE became its only owner, the new GE CELMA decided to stop the production of turbines. In 2004, foreseeing the possibility of a contract with Pratt & Whitney, Grauna considered renting the machinery that had been acquired, meanwhile, by the Brazilian government. The machinery would allow Grauna to produce turbine components to be supplied to Pratt & Whitney. They proposed the idea to Pratt & Whitney, who accepted it.

In 2005, Grauna and Pratt & Whitney signed their first contract. Grauna, however, was unable at that time to reach an agreement with the Brazilian government to rent the machinery, so it was necessary for Grauna to find a source of investment to buy new machines and to increase its technological abilities to produce Pratt's components.

It was in this context that Grauna received BNDES investments. According to the company, three factors played a key role in the bank decision: (1) their project was not exclusively connected with Embraer; (2) they already had a commitment with Pratt & Whitney; and (3) Brazil would again have the production of turbine components.

The BNDES investment was made mainly through the BNDESPAR (BNDES's management company of social participations) that acquired 40% of Grauna's share, assuming the position formerly held by Stratus as the provider of venture capital.

After these investments, Grauna was able to successfully access the Pratt & Whitney supply chain, producing high added value turbine components.

It is important to mention that initially, the principal aim of the contract was the supply of components for the turbines of Embraer's Phenom 100 and Phenom 300 projects as a consequence of Embraer's local content rules supported by BNDES.

However, through Pratt & Whitney, Grauna started to also access other GVCs. Actually, the contract with Pratt & Whitney represents 25% of Grauna's production; most of the components Grauna produces are supplied not to Embraer, but to other MNCs such as Cessna, DASSO, Finmeccanica, Boeing, and Airbus.

BNDES's investments in Grauna have the same characteristics of BNDES's first program, CONTEC—Program for the Capitalization of Technological-Based Companies (Programa de Capitalização de Empresas de Base Tecnológica), which was developed with the aim of capitalizing technologically based SMEs through the purchase of shares (the most common approach) or convertible bonds without collateral by the BNDESPAR. The CONTEC was a pioneering and experimental program created in 1991 that, due to its success, was then consolidated and gave rise to a new mode of operation of the bank (Shapiro, 2010) (see Box 7).

The participation of BNDESPAR in the company is limited to 40% of the total capital—the Brazilian institution does not aim to take full control of companies. Although the shareholders' agreement has a provision for a seat on the board of directors (which is required and may regulate all the obligations between the shareholders), BNDESPAR, as in the case of

Grauna, usually does not exercise this right due to the strategy of maintaining a distance from the decision-making bodies of the business.

The monitoring, however, is considered to be of significant relevance and is done closely, although through more informal instruments, such as periodic reporting, discussions about the business plan, suggestions made in the administration framework of the enterprise, etc.

For the participation of the BNDESPAR in the companies' capital, it is required for the enterprise to adopt the legal form of a corporation, due to the wider guarantees offered to minority shareholders, and, as mentioned before, the more sophisticated administrative structure. In the case of Grauna, this had already happened.

In general, it is established that the BNDESPAR exits from the company capital in four years. The ideal method would be for the corporation to go public and issue shares on the stock market. Since Brazil doesn't yet have high liquidity in the stock market for businesses that are not very well known, alternative methods were developed, such as a share buyback or a public auction of the shares, where the controlling shareholder commits to buying the shares himself.

### **3.2.1 Contractual Practices between Grauna and Pratt & Whitney**

Grauna was successful in accessing Pratt & Whitney's GVC and reaching a position better than its position in Embraer's GVC. Grauna is a component supplier, not a subcontractor, of Pratt & Whitney. The MNC provides the product design, transfers the knowledge about how to produce the goods, and pays for the components, not for work on a man/hour basis. Grauna is responsible for buying the raw material and for performing all the activities necessary to deliver the final product: the turbine components.

The different status—"supplier of Pratt & Whitney" versus "subcontractor of Embraer"—reflects the different contractual practices employed, and the benefits of Grauna's new position in a GVC.

Since the beginning of the relationship, **Grauna and Pratt & Whitney have had a written contract**. It is a long-term agreement lasting ten years; it will be executed through different purchase orders. Although Pratt & Whitney is not obliged to buy during the entire period, the orders are issued six months before delivery and the MNC guarantees at least two months of its forecast. Therefore, the Pratt & Whitney contract offers better guarantees and

greater stability than Embraer's contract, allowing Grauna to have better predictability of their business activities.

Another important difference is that Pratt & Whitney also allows Grauna to disclose their contract to obtain loans, which has, as already mentioned, played a significant role in their access to the BNDES financing program.

Pratt & Whitney, contrary to Embraer, also guarantees Grauna's exclusivity in relation to the components supplied, but, as in Embraer's case, protects its product design through the use of intellectual property rights. Grauna, on the other hand, can use the know-how transferred from the MNC to produce different products for other clients. In Pratt & Whitney's case, this was a significant benefit to Grauna.

Also, the certifications are an important requirement. Grauna must have ISO 9000, NBR 151000, and Pratt & Whitney's own certification. As with Embraer, Grauna must bear the cost of the first two certifications.

In the case of breach of contract, there is a clause of termination for cause. Nonetheless, the disputes arising are to be resolved by informal mechanisms. According to an interviewee, the bargaining power between the enterprises is very unequal and the contract is "made not to be used." Again, the most important aspect of the contract is the relationship between the firms and the trust, which takes many years and considerable effort to establish.

### **3.3 Access to New GVCs: Access through Networks**

The other strategy Grauna employed to attempt to gain access to new GVCs, and also participate within Embraer's GVC in a better position, was their participation in an intermediary; namely, the High Technology Aeronautics (HTA).<sup>26</sup>

It is important to mention that the Brazilian firms of the aeronautics sector have never had a strong sector association that could work as an intermediary for the SMEs in their aim of accessing new GVCs, as was the case in the coffee sector.

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<sup>26</sup> There were two main associations in the aeronautics sector in Brasil: (1) the AIAB (Brazilian Association of Aerospace Industries), the first and most traditional sector association; and (2) the CECOMPI (Competitiveness and Innovation Center of the Northeast Region of São Paulo State), which is not exclusively dedicated to the aerospace industry, although most of its members act in that sector. While the main function of the AIAB is to act as an intermediary between the sector firms (including, and specially, Embraer) and the government; the CECOMPI originally had as one of its main functions the role of a business incubator. It was only after 2008 with Apex-Brasil support that it started to have a very important role in helping local SMEs access GVCs.

In considering the factors that were critical for achieving this goal, we can underline the creation of the consortium HTA itself, in which the support of Apex-Brasil was fundamental, and the offset program of the Brazilian government.

### **3.3.1 The Creation of HTA**

As mentioned above, the HTA was created within the Apex-Brasil program Consórcio de Exportação (consortium to export).

Grauna's chairman, together with other companies of the sector, from the region of São José dos Campos, developed the project as requested by the Apex program in order to submit it for approval, with the aim of forming a consortium to act as an intermediary and to facilitate the access of the participating firms into new GVCs.

Some of the specific goals to be achieved with the creation of the HTA consortium were: (1) to access the international market through the joint efforts of the consortium's members, sharing the costs, and learning together how to export; (2) to be able to buy their own raw material and provide to costumers (Embraer and other MNCs) a "complete solution" as requested by Embraer's and other MNCs' new strategies; and (3) to decrease their dependency on Embraer.

In 2000, their project was approved, and the "consortium" HTA was created with eight founding members (see Table 5).

According to an interviewee, the creation of a network like the one suggested by the Apex program was fundamental to allow the single SMEs, such as Grauna, to access new GVCs. Alone, each SME would have had to invest individually in order to participate in international fairs (considered to be of particular importance in establishing and developing contact with new MNCs), to administer the new international contracts, to develop a logistics department, etc. Most of these are fixed costs that could be shared among the other firms of the consortium and which are significantly decreased with the support of Apex (interview with Grauna; Quintanilha and Almeida, 2008).

Furthermore, the SMEs alone were too small to be able to participate in the BNDES financing programs, especially as a result of not having enough guarantees to offer. The consortium could, therefore, also constitute an instrument to facilitate their access to these types of program.

Another important point is that the consortium would allow these companies, jointly, to supply a more complex final product to MNCs, such as an entire subsystem, for which each

of the companies would be responsible for a part of the production (supply of different parts, components, and services) according to their skills and abilities.<sup>27</sup> This would represent a mechanism to allow the MNC to adapt to the new business model adopted by Embraer and other MNCs, which prefer to establish direct relationships only with suppliers of complete components or subsystems, and not with small suppliers of parts and services, delegating to the first-tier suppliers or risk partners the integration tasks.

### **3.3.1.1 The HTA Governance and Contractual Activities**

As it was established, the HTA initially had seventeen members. The selection of the SMEs, according to the former HTA president, was based on three criteria: (1) they should produce predominantly for the aerospace sector; (2) they should have the ISO 9000 certification; and (3) they should pay an entrance fee and a monthly rate to support the consortium activities.

The idea was for the HTA to operate as an intermediary between the single SMEs and the foreign contractors.

The HTA would represent a common brand to be promoted in the foreign market. The consortium would have direct contact and sign the contract directly with the client; would administrate the contract, the logistical aspects, and the engineering support; and would subcontract the production to the members individually (see Figure 5).<sup>28</sup>

The performance of the contract would be provided by different individual enterprises, coordinated by HTA. The consortium was formed with SMEs having some complementary abilities, but also with competitive ones (Quintanilha and Almeida, 2008). The selection by HTA of the contractual performers occurred through a competitive process, and the enterprise with the best bid would be selected.

To perform all these activities, the HTA had to establish HTA as a limited company because of the difficulties of the associational model. It is very interesting to note that, although in Brazil the consortia are regulated by law 6.404/76 “Lei das S.A.” as a contract between companies with the aim of undertaking specific projects (Art. 278), Apex-Brasil recommended the legal form of a nonprofit association. This form of association, regulated by

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<sup>27</sup> HTA’s statute also provided that if none of the consortium members had the expertise to supply a specific product or service, external companies would be hired to perform the task.

<sup>28</sup> According to HTA’s statute, the consortium should perform the following activities: (1) control of contracts; (2) technical management of the projects; (3) coordination of the supplying firms; and (4) marketing and sales of aeronautic products and services compatible with the capacity of its members and of the HTA itself. When necessary, HTA could also perform the following activities: (1) general logistics; (2) import and export; (3) buy raw material and equipment; and (4) acquire complementary products and services from other suppliers.

the Brazilian Civil Code, has, unlike the consortium, distinct legal personality and a statute that may contain different information, and it gives rise to obligations and rights on the part of the members and of the association; further, it has an administrative structure, with administrative and deliberative organs (see Boxes 8 and 9).

The legal form of a nonprofit association, however, was incapable of being adapted to all the functions and activities of a consortium to export, at least in the case of HTA. Therefore, HTA had to create a limited partnership (*sociedade limitada*) in order to perform its economic activities, and in particular to enter into contractual relationships with MNCs.<sup>29</sup>

Although the HTA was created in 2000, it participated in its first international fair in 2001, on the basis of which they reached an agreement to access a new GVC through a long-term agreement with EADS-CASA in 2005. One of the reasons for this delay in obtaining a contract with an MNC was the significant crisis faced within the sector following 09/11.<sup>30</sup>

It is important to mention that one of the main goals of the HTA was also to become a risk partner of Embraer. As already mentioned, alone, each single SME neither had the financial capacity to invest in such a project nor the complementary abilities to produce a subsystem. Through a network such as HTA, they could coordinate their production and share the risk of participating in Embraer's risk-partner strategy.

They prepared a proposal and participated in Embraer's selection for the Phenom program to supply the central fuselage. Their proposal was behind only that of ENAER (the Chilean company) after the initial selection procedure. ENAER and HTA started to work on a joint project, but Embraer decided not to adopt the risk partner strategy in this case and produced the subsystem internally.

Therefore, in this case the goal was not achieved, although HTA, according to the interviewees, had the technological and administrative capacity to perform the series of activities involved in being a subsystem integrator.

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<sup>29</sup> This new company was formed with 99% of its shares held by the "nonprofit association" HTA, and 1% owned by its former president (prior to 2011, the single-member limited company was not recognized by the Brazilian legal system). Therefore, 99% of the profit earned by the limited company went to the nonprofit association. As it could not be distributed among its members, a reserve was established, to be used to deduct the monthly fee that each member would have to pay and also to finance the consortium after the end of the Apex support (that was, in general, provided for the first three years).

<sup>30</sup> 9/11 triggered a crisis in the aviation industry worldwide. MNCs began to reduce the import of parts and even to break several contracts, as there was a much lower demand for new airplanes. Some of them started to produce parts and components internally, the production of which was initially subcontracted, and also began to take control of the labors that were available with the reduction of production (Quintanilha and Almeida, 2008).

### 3.3.2 The Offset Program

A very significant factor that concerned the access of the HTA and its members in this new GVC was the offset program of the Brazilian government.

The Brazilian government has for many decades used offset agreements, especially in the aeronautics sector, with the aim of generating benefits of a commercial, industrial, and technological nature.

In 2002, the Ministry of Defense's offset policy was formalized through an internal norm (the Portaria Normativa nº 764/MD), which established the Technological, Commercial, and Industrial offset policy. According to the Brazilian legislation, all the contracts negotiated by the Ministry of Defense and its commands for the import of goods or services with an estimated value more than the equivalent of USD 5 million (with a single supplier and over a period of twelve months), must, necessarily, include an offset agreement. For similar contracts with an estimated value of less than USD 5 million, the offset agreement is optional, depending on the aeronautic's interest.

The contract signed between HTA and EADS-CASA was part of an offset agreement established by the Brazilian Minister of Defense for the acquisition of light airplanes for transportation (C-295BR) from European EADS-CASA.<sup>31</sup> Among the compensation required, such as transfer of technology and the provision of support to the Brazilian company Eleb in selling its products to other enterprises of the EADS group, it was specifically requested that EADS-CASA had to buy parts manufactured in Brazil valuing at least USD 30 million (BNDES website). It was within this context that HTA, and its members, had access to the EADS-CASA supply chain.

EADS-CASA signed a ten-year, long-term agreement directly with HTA for USD 30 million for the supply of parts. HTA, as mentioned before, then subcontracted the production to its members. Grauna and ThyssenKrupp, both members of HTA, were the two main enterprises that were subcontracted to produce the parts requested by EADS-CASA. Grauna, therefore, accessed EADS-CASA supply chain, through the intermediary HTA.

The role of HTA as an intermediary was fundamental to the effectiveness of the compensation scheme provided by the offset, and was mentioned by the vice president of EADS-CASA as a unique case of success. It is important to mention, however, that the

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<sup>31</sup> Among the recent offset agreements established by the Aeronautic Command through the DCTA are ones related to: the contract with the Israeli ELBIT for the modernization of the F-5BR airplanes in 2001; the import of the presidential airplane (ACJ-319) from Airbus in 2004; and two with EADS-CASA, both for the acquisition of C-295BR airplanes and for the modernization of P3-BR airplanes in 2005.



financial crisis of 2009 strongly affected the sector and slowed down the purchase orders from HTA and EADS-CASA.

### 3.3.3 The Quiescence of HTA

Formally, HTA still exists, even though it is no longer in operation. Different factors have contributed to this outcome.<sup>32</sup>

**One very important point is the end of the support of the Apex-Brasil program in 2009.** This decision was a result of a restructuring of Brazilian agencies' policies that, due also to resources problems, led the Apex-Brasil, in all sectors of the economy, to give priority to Integrated Sectorial Programs (PSI) of national range. Therefore, partnerships with associations that represented entire sectors of the economy were prioritized.

According to the literature, the agency's strategic choice was made with two purposes: (1) to optimize the utilization of the diminished budgetary resources; and (2) to ensure an effective engagement with the entire sector (Caixeira, Galuppo, and Netz, 2006).

Therefore, in the case of the aeronautics sector, Apex-Brasil formed a new partnership with CECOMPI within the PSI Brazilian Aerospace Cluster, with the aim of promoting the competitive insertion of the Brazilian SMEs in GVCs and increasing their exporting capacity and the diversification of the markets. It counts also on the support of other private and public institutions, such as the Municipality of São José dos Campos (PMSJC), SEBRAE, CIESP, and AIAB.

Without the financial support of Apex, however, the cost of the consortium for its members had suddenly doubled, becoming too expensive for some members (Grauna interview).

Within this context, the significant crisis that the sector has faced in the last years after the worldwide financial crisis must also be considered. Most of the HTA members found themselves in a very critical situation. Contracts were breached, product orders (such as those from EADS-CASA) were highly reduced or suspended, and with the devaluation of the dollar, Brazilian suppliers became more costly for international buyers. These conditions

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<sup>32</sup> Another important factor that encouraged some original members to leave the consortium was the increase of Embraer's production between 2005 and 2007 (Projects ERJ 170/190). While HTA was having difficulties signing new contracts abroad, Embraer significantly increased the demand on its local suppliers and subcontractors. Consequently, some of the original members, satisfied with Embraer's increased demand, decided to quit the consortium and gave up the project of accessing new markets, focusing only on supplying to Embraer.

decreased the probability of achieving new international supplying contracts and significantly reduced the revenues generated from those already in existence.

Another point to be considered concerns HTA governance. As the HTA was formed by SMEs, who were engaged in competitive activities, the competition process for the subcontract mainly favored enterprises with better structure and higher capabilities of production, to the detriment of smaller ones, which became unsatisfied (MDIC interview).

Another interesting point that can be mentioned is that some MNCs, such as Pratt & Whitney, had preferred to establish the contract directly with the enterprise responsible for the production, instead of with the HTA. One reason was that Pratt & Whitney didn't feel sufficiently secure in establishing a contract with a company formed essentially by a nonprofit association, without any significant assets, and also without knowing at the outset the identity of the party that would be effectively responsible for the production of the components.

In fact, the only contract signed directly with the HTA was the one with EADS-CASA through the offset agreement. However, HTA played a key role for Grauna in securing contracts as a single enterprise. This was the case in relation to the contract with Pratt & Whitney, which first approached HTA but then chose Grauna. It was also the case in relation to the contract with Asco and FAAC. In fact, the joint marketing and the participation in international fairs were of high importance to open the doors to the HTA members to meet new MNCs and to sign new contracts, even if individually.

Despite the difficulties faced by the HTA and its actual quiescence, most of the public and private actors of the sector (such as the BNDES, the ABDI, HTA's ex-president, Grauna, and others) believe that the consortium is a valid model. With some alteration in its governance structure and with the appropriate public support, it could be an efficient instrument to facilitate the access of the Brazilian SMEs to new GVCs in the aeronautics sector.

It is important to mention that on the renewal of the above-mentioned PSI program between Apex-Brasil and CECOMPI, one of the main goals pursued is exactly the development of "collaborative networks" in order to allow the SMEs to supply a complete and more complex final product to MNCs and to acquire a better position within the GVC.

Currently, most of the HTA members participate in the CECOMPI program with Apex-Brasil, which undertakes some of the activities once performed by the HTA, such as the participation in international fairs.

### **3.4 Benefits of Access to New GVCs and Spillover Effects**

Grauna has successfully reached its aim to access other GVCs, both directly and through an intermediary, the HTA.

The actual production output of Grauna can be currently divided as 65% to Embraer, 25% to Pratt & Whitney, and 10% to other MNCs (such as Asco from Belgium and FAAC from Austria) and to other economic sectors (such as the industry of petroleum and defense). Although its relationship with Embraer is still characterized as a subcontracted one, Grauna managed to access new GVCs in better positions. In fact, the Brazilian company became Pratt & Whitney's supplier of complex components.

One of the benefits of this access to other GVCs is the diminished dependence on Embraer. Another very important point is that its access into new GVCs allowed Grauna to learn about new technologies and know-how. In the case of the contract with Pratt & Whitney, for example, the Canadian company transferred to Grauna the technology necessary to deal with a nickel alloy. This transfer of technology allowed Grauna to produce for other sectors (for example, for the petroleum industries), which also demand this kind of high technology.

It is important to mention that Grauna's access to GVCs has also benefited other enterprises in the sector. One significant example is Metinjo Metalização Industrial Joseense (Metinjo), specialized in the superficial treatment of parts, and also an HTA member. Metinjo was a very small company that alone would be unable to access new GVCs. Metinjo undertook the superficial treatment of the parts produced by Grauna for EADS-CASA within the HTA consortium. In the contract with Pratt & Whitney, Grauna continued to use Metinjo's services, allowing the enterprise to receive the certification of the Canadian company. Following the certification by Pratt & Whitney, Metinjo was also certified by Embraer and, more recently, has been certified by Boeing to provide the superficial treatment of the parts that Grauna supplies to Asco and that are part of the subsystem that the Belgium company supplies to Boeing.

### III—THE COFFEE SECTOR

#### 1. Global Industry Section

##### 1.1 Main Actors, Products, Trade Volumes

The coffee agroindustry comprises different goods, the production of which, from the coffee cherries to the roasted and instant coffee, is organized through several steps that, most often, take place in different countries.

Coffee's global value chain (GVC) can be divided into five stages: production, processing (the first two together can be considered as the farming stage), commercialization, industrialization, and distribution. The farming stage is composed of seven different tasks: planting, harvesting, peeling, first processing (dry or wet), drying, screening, and, lastly, distribution and storage; the commercialization stage is composed of the tasks of grading, sorting, and packing. Finally, the industrialization stage usually includes up to four different steps: roasting, milling, solubilizing, and lyophilization, which will be followed by the packing and distribution (Stanley, 2010).

**Geographically, there is a net division between the farming stage and the industrialization stage. While the first stage is concentrated in developing countries (where often the product has a major importance for the economy), the other stages occur mainly in developed countries, where, in general, the consumption market is also concentrated.**

The main three coffee producers are Brazil, Vietnam, and Colombia (see Table 6). They were responsible in 2010 for around 57% of the 102.9 million coffee bags (60 kg each) exported in the world (see Table 7). Other important producers are Indonesia, Ethiopia, India, Mexico, Guatemala, Honduras, and Ivory Coast (International Coffee Organization [ICO] website).

On the other hand, the leading importing countries are the United States, Germany, Italy, Japan, France, and Belgium (see Table 8).

The United States was responsible for 16.24% of consumption in the world coffee market in 2009, followed by Brazil (13.79%), Germany (6.74%), Japan (5.57%), Italy (4.42%), and France (4.21%) (see Table 9). Brazil is the only country that figures in both groups of major producing and consuming countries. In terms of per capita consumption,

Scandinavian countries stand out. Finland, Norway, Denmark, Switzerland, and Sweden are, in fact, the biggest per capita consumption countries in the world.

Regarding the **product**, in the farming stage, although there are many species and varieties of coffees, in respect to its economic importance, there are two main species: *Coffea arabica* and *Coffea robusta*. The species *arabica* is the best known, with a higher economic value and representing around 60% of the green coffee commercialized in the world. Its production is located mainly in South and Central America, Eastern Africa, Arabia, and Asia (ICO website).

The production of high-quality coffee is based on varieties of the *Coffea arabica* species.

The *Coffea robusta*, on the other hand, is a product with lower economic value, used mainly in the instant coffee industry and cultivated predominantly in western and central Africa, throughout Southeast Asia, and also in Brazil (ICO website). Brazil produces both species, although production of *robusta* coffee is significantly less than *arabica* production.

The first products of the coffee GVC are the coffee cherries, which, after the processing and at the end of the farming stage, become what is called “green coffee.” The green coffee beans constitute the exporting product of the producing countries.

Regarding the industrialization stage, the final products produced from the green coffee are basically three: (1) roasted coffee; (2) roasted and ground coffee; and (3) instant coffee (Jayo and Saes, 1998).

Historically, four major parties have played critical roles in the coffee production chain: (1) **the producers; (2) the national marketing boards and producer associations in producing countries; (3) global traders; and (4) roasters** (Kaplinsky, 2004). Another player that in the last decades has acquired significant importance in the coffee GVC is big coffee retailers, such as Starbucks<sup>33</sup> (Stanley, 2010).

The role and power of all these actors within the chain, however, have significantly changed over the last decades with the great transformation of the coffee market structure after the introduction of the International Coffee Agreements (ICA) regime (see below). While producers and market boards of the producing countries had a significant role during the ICA regime, their power has significantly shifted to the international traders and roasters after the end of the international regulation. It is possible to affirm that in the commodity

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<sup>33</sup> In some cases, they are the most powerful agent in the production network. Starbucks is the emblematic case, with sales stores in more than fifty countries (Stanley, 2010).

coffee market the most powerful players of the coffee value chains are the international traders and, especially, the roasters.

It is also important to underline that the coffee market can be divided into two different segments: the commodity and the differentiated segments.

## **1.2 Industry Trends**

The coffee business has long been structured almost exclusively around the commodity model, which today represents 88% of the coffee commercialized in the world (BSCA interview). However, in the last twenty years, a new business model based on product differentiation has been developed, with higher added value of the product that can provide higher and more sustainable incomes for producers (Fitter and Kaplinsky, 2002).

The development of this alternative model, which may represent an important opportunity for Latin American countries, is closely related to the great restructuring of the market after the end of the international regulation and the liberalization of the domestic coffee market in the producing countries.

Coffee was one of the first commodities to be internationally regulated. In 1962, the first International Coffee Agreement (ICA), under the auspices of the International Coffee Organization (ICO),<sup>34</sup> was signed, including the majority of producing and importing countries (Saes and Nakazone, 2002).

The ICA's regime consisted of determining a target price in the international market and of allocating export quotas for each of the producing countries. During the periods when the ICO price indication surpassed the established target, quotas were relaxed. However, when the opposite happened, quotas became even more restricted.

The domestic entry barriers, regarding both farming and trade, were often mediated by the governments of producing countries that regulated the domestic market. On the other hand, entry barriers for countries as producers' units were politically negotiated within the ICO mechanisms, through the establishment of the quotas and its renegotiation (Ponte, 2004).

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<sup>34</sup> According to the entity's website, ICO is the most important intergovernmental coffee organization, uniting exporting and importing countries' governments to deal with the global challenges faced in the coffee sector through international cooperation. Member countries represent 97% of world coffee production and 80% of world coffee consumption. ICO's objective is to promote coffee production sustainability worldwide and to reduce poverty in developing countries. Available at: [http://www.ico.org/mission07\\_e.asp](http://www.ico.org/mission07_e.asp).

This system was an efficient one for the maintenance of an artificial, high, and stable coffee price, establishing also a relative equilibrium of income distribution between consuming and producing countries (Ponte, 2004).

While **coffee market control** was in force, **the coffee supply chain was characterized by the predominance of market relations, little vertical integration, and a few long-term contracts** (Barra, Oliveira, and Machado, 2007). According to Ponte, during the period of market control, there was a fairly balanced contest between producers and consumers within the politics of the commodity agreement (Ponte, 2001).<sup>35</sup>

Although it is theoretically possible to conceive of the coexistence of market control and global supply-chain control by powerful agents within the chain, i.e., MNCs at the buyer pole of the chain, Ponte's statement seems to be confirmed by the following circumstances: (1) there seemed to be little space for chain control, because the exporting market was controlled by national governments that worked as "market units," deciding on the issues concerning domestic exporting quotas' distribution (Ponte, 2001); (2) before market liberalization, there were no problems of supply shortage, and coffee traders and roasters didn't have to seek a stimulus to guarantee supply; and (3) there was no market for a highly differentiated product, and coffee was traded as a commodity product classified by reasonably harmonized and simplified international classification systems (Andriani and Herrmann-Pillath, 2011).

Therefore, the fairly homogeneous form of trade, characterized by the commodity model, limited the possibilities of product differentiation. With the listed prices, there was no possibility of adding value to the product, and the fixed quotas and artificial high price established through the ICA discouraged the producers from investing in better quality or other forms of differentiation.

**With the collapse of the ICA's regime in 1989, however, the structure of the coffee market and of its GVC has changed significantly, bringing important (and, in most cases, negative) consequences for the agents of the producing countries.** One of the main results for the end of the ICA regime, in fact, was the **significant change in the balance of power within the coffee GVC**. As affirmed by Ponte, **market relations shifted from the described relative equilibrium between agents from producing and consumption**

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<sup>35</sup> According to Kaplinsky, if some signs of governance could be found in the coffee GVC during the ICA regime, it was to be found only in the producing countries, where the market boards or "Institutos" (such as the Brazilian Instituto do Café) played a key role (Kaplinsky, 2004).

**countries to a dominance of international traders and roasters over farmers, local traders and governments of the producing countries** (Ponte, 2001).

The coffee GVC also saw a fast concentration of the buyer pole, both from traders and, especially, from roasters that became the drivers of the commodity coffee GVC according to the definition of Gereffi, Humphrey, and Sturgeon (2005).

These changes have also been accompanied by lower and more volatile coffee prices, a higher proportion of the income generated in the part of the value chain belonging to consuming countries, and even a significant production crisis in some countries.

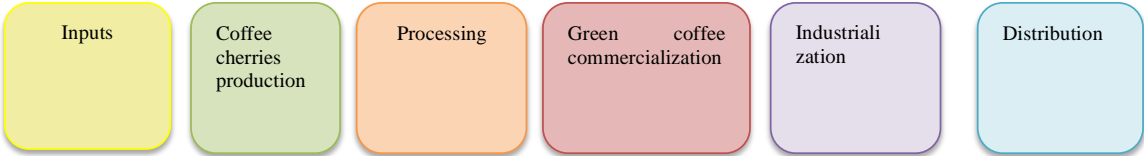
All of these transformations, which we will review from the Brazilian point of view, created the context for the development of a differentiated coffee market with distinct GVC structures and ways of access, which became a good alternative for producers to escape from the uncertainty of the commodity market (see Barra, Oliveira, and Machado, 2007; Daviron and Vagneron, 2010; Fitter and Kaplinsky, 2004; Lee, Gereffi, and Beauvais, 2011; Ponte, 2001).

In this process, new intermediaries—such as the Brazilian Special Coffee Association (BSCA), supported by the Brazilian government, and even an MNC like Illycaffè (Illy)—played a key role in the development of this market in Brazil and in Brazilian producers' access to the GVC and to the international market.

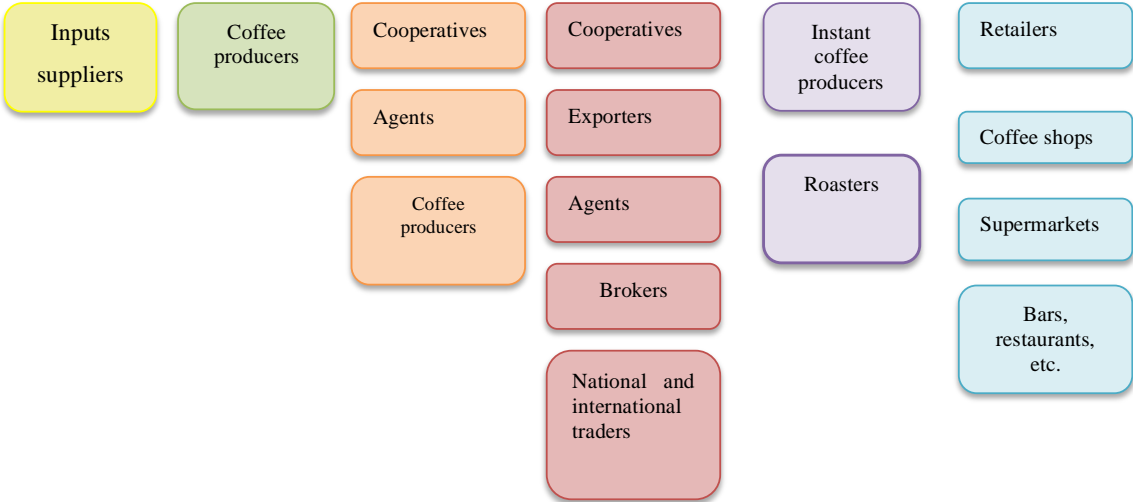


**Figure 6. Commodity Model Coffee Supply Chain**

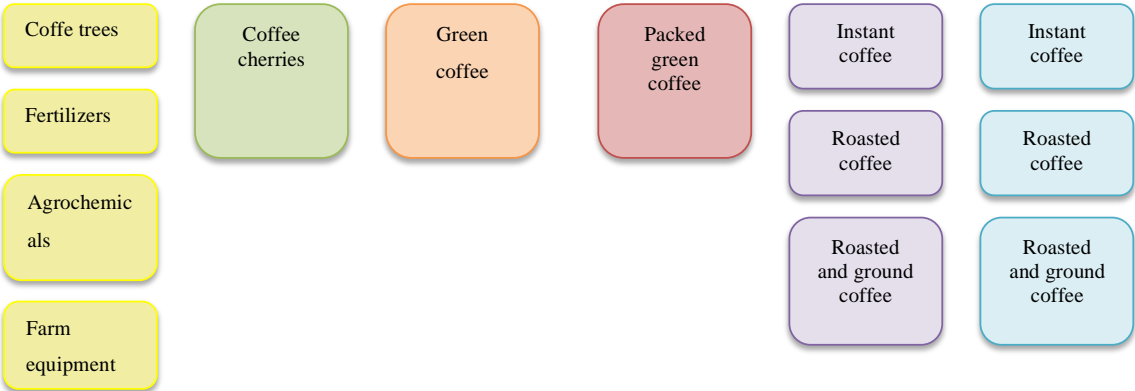
**Activities**



**Actors**

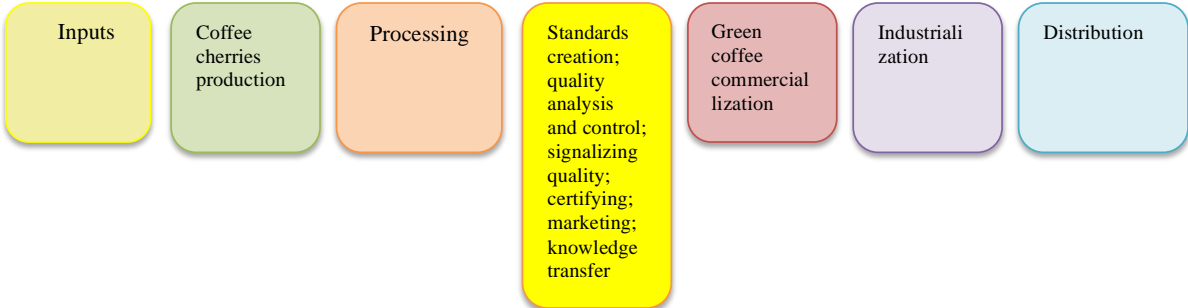


**Products**

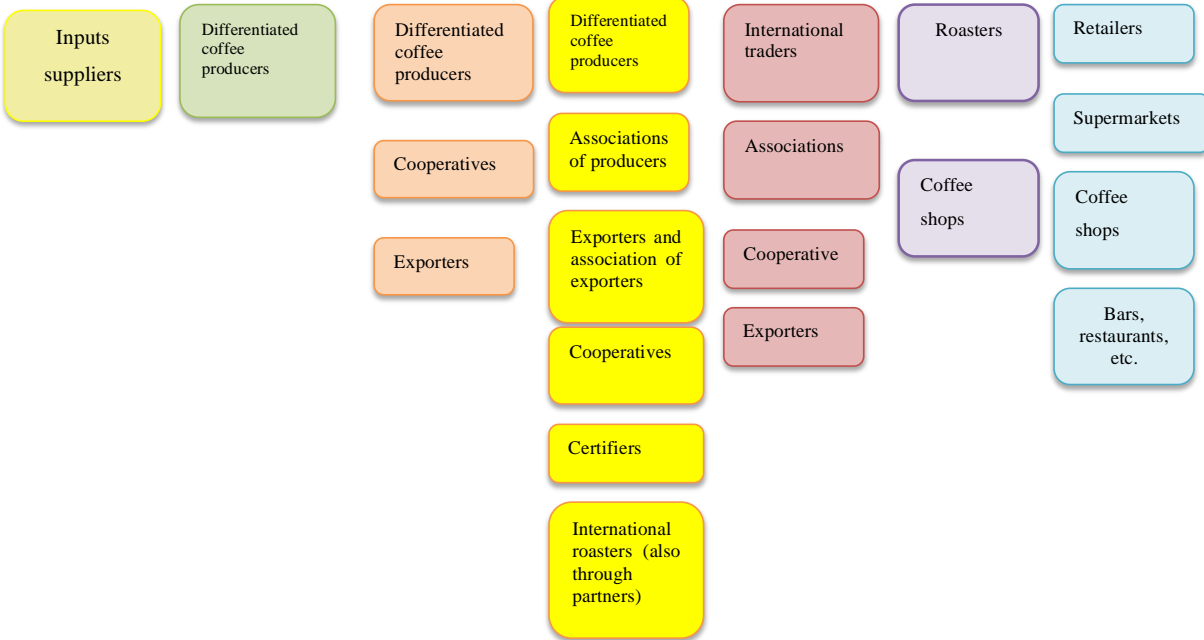


**Figure 7. Differentiated Coffee Supply Chain**

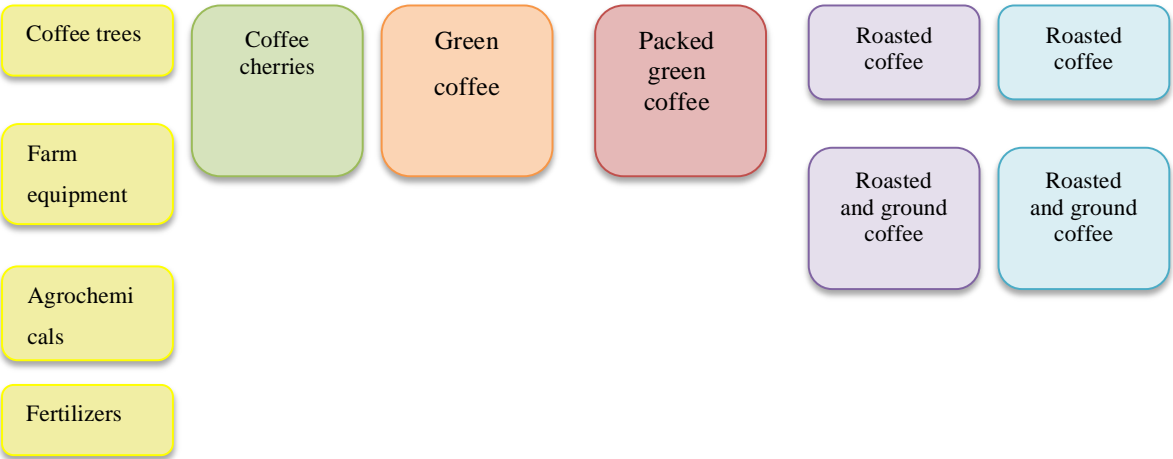
**Activities**



**Actors**



**Products**



## 2. COUNTRY INDUSTRY SECTION

### 2.1 Liberalization of the Coffee Market at the National Level

Coffee has played a significant role in the Brazilian economy for a long time. It represented 70% of Brazilian exports in the 1920s, and for many decades maintained itself as Brazil's main export product. Since 1860, Brazil has been the main producer of coffee, becoming responsible for 80% of the world's total production (Saes, 1995). Although its importance to the Brazilian economy has reduced through the decades, it still represents around 2% of Brazilian exports.

Brazil was one of the main signatories of the ICA and **supported a market policy control until the beginning of the 1990s**. In fact, one of the reasons<sup>36</sup> for the success of the international agreement was precisely the support of Brazil as the leading producing country that, with the aim of attracting other producing countries to set a price sustainability and stability policy, established itself as a residual offerer, retaining its stocks while other countries expanded their production (Saes, 2008).

Internally, in 1952 Brazil created the Brazilian Coffee Institute—IBC (Instituto Brasileiro do Café), which was the governmental entity equivalent to a national marketing board.<sup>37</sup> Representing mainly the interests of the coffee producer association,<sup>38</sup> it was in charge of defining and coordinating the coffee sectorial policy and was also responsible for the distribution of the national export quotas through the exporters. Among its many activities, there were (1) the promotion of public research; (2) technical and economic assistance for coffee production; (3) quality control; and (4) the establishment of an official classification system. All of these activities were performed according to a strategy of making

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<sup>36</sup> According to Ponte and Daviron, the other factors that have contributed to the relative success of the regime are: the participation of consuming countries in the workings of the quota system; the existence of producing countries as “market units,” where governments were in control of decisions concerning exports—a common strategy of import substitution in producing countries, which required maximum mobilization of export earnings (therefore high commodity prices) (Ponte, 2001; Daviron, 1996).

<sup>37</sup> Due to the importance of the sector to the Brazilian economy, the IBC was related to the actual Ministry of Development, Industry, and Foreign Trade, and not to the Agriculture Ministry. Only in 1996 was the coffee sector brought within the Ministry of Agriculture, with the creation of the Conselho Deliberativo da Política do Café, which was the new body responsible for the direction of the sector policy in the country.

<sup>38</sup> During the period of coffee market control, there were four associations related to the coffee agro-industry, whose main roles were to act as intermediaries between their members and the State. They were: (1) CNC: the Conselho Nacional do Café, which represented the green coffee producers; (2) ABIC: the Associação Brasileira da Indústria de Café; (3) ABICS: the Associação Brasileira da Indústria de Café Solúvel; and (4) FEBEC: the Federação dos Exportadores de Café.

Brazil an exporter of quantity, rather than quality, a strategy which fits within the commodity model of production.

During the same period, Brazil also maintained coffee price tabulation. This price control practice, related also to public policies to control inflation, is considered to be the major cause for the consolidation in Brazil's coffee market of consumers', retailers', and governmental authorities' belief that coffee is a homogeneous product (Saes and Nakazone, 2002). As a consequence, there was no space to add value to the product through differentiation. Another important point is that a guaranteed fixed price led to a systematic decrease in Brazilian coffee quality, with negative impacts on its export, especially after the deregulation of the international market. Brazil, in fact, became recognized worldwide as an exporter of low-quality coffee.

In 1989, as already mentioned, the ICA regime collapsed, changing completely the global and national coffee market structure, **modifying both the scope and instruments of GVC access for Brazilian producers**. The collapse of the ICA system was also influenced by Brazil, which, due to internal political and economic changes, started to object to continuation of the approach based on a restrictive policy with respect to its export quota. The importance of the product for the Brazilian export rate had significantly decreased, and so did government interest in maintaining such a costly policy in the sector. Furthermore, consumption patterns were changing, and global economic ideology was also going through major modifications promoted by the advancement of neo-liberal ideals, which were contrary to state interventionism and in favor of economic liberalization (Fishlow, 2011). In fact, the 1990s in Brazil were marked by a liberalization policy that determined the end of state intervention and the submission of several sectors of the economy to the rules of market. The reflection of this policy change can be seen in both the aeronautics and coffee sectors.

Following this new policy, the coffee market liberalization process in Brazil, after the breaking-up of the ICA in 1989, was achieved through the abolition of the IBC in 1990 and the end of the price-fixing control in 1992 (Nunes and Saes, 2001).

Internally, these organizational and institutional changes yielded major transformations, such as price liberalization, elimination of the control of product flow, and also the end of the activities performed by the IBC—among them economic and technical support for the producers, the coordination of public research, and information transfer.

Internationally, the political negotiation over quotas was substituted by market relations, the power of the ICO had been voided, and Brazil, like all other producing

countries, had lost its “voice” and practically disappeared as an actor in these interactions that became mostly dominated by the buyer pole (Ponte, 2001).

The liberalization of the coffee market, as already mentioned, was then followed by a drastic reduction of the coffee price level in the commodity market and a significant increase in the price volatility level. To make the situation worse, the deregulation and the following consolidation in the coffee industry also affected the distribution of total income generated along the coffee GVC. In fact, while the average total income retained in producing and consuming countries was around 20% versus 53% in the 1970s; it became around 13% versus 78% in the '90s, with a substantial transfer of resources for the producing countries' operators (Talbot, 1997; Ponte, 2001) (see Figure 8).

On the other hand, not only had gross margins increased for roasters, but profits also increased. In fact, while in 2001 the commodity price for coffee reached insufficient values to cover producers' costs—although labor costs in small family farms tended toward zero (Fitter and Kaplinsky, 2002)—in the same period, the profits of large roasters and coffee-shop chains had increased (Saes, 2008).

Liberalization provoked an overproduction crisis in the 1990s, showing that the productive structure based on large-scale production (as was the approach of most Brazilian producers), and on price competitiveness, was incompatible with the price-drop scenario and also with the emergence of a new coffee consumption pattern (Leão and Paula, 2010). In fact, in the same period, consumption patterns were changing, with an increasing focus on food safety awareness, health and diet, consumers' tastes, and social and environmental concerns (Ponte and Gibbon, 2005).

Another consequence of the liberalization was a significant fall in coffee quality in Brazil, due to the necessity of producers to lower their prices in order to be able to compete, and also to the end of IBC activities related to quality control. This promoted, therefore, the direct participation of traders, roasters, associations, and other intermediaries in tasks related to quality control.

## **2.2 The Development of a Differentiated Coffee Market in Brazil**

One significantly important consequence of the liberalization of the coffee market in Brazil was that it created the economic incentive and the necessary institutional environment for the development of a differentiated coffee market (Barra, Oliveira, and Machado, 2007).

Coffee can be differentiated in many different ways. **The most important differentiation types are product-related differentiation (which concerns physical quality properties of the product) and production process–related differentiation (which concerns the authenticity of origin and sustainability practices regarding environmental—organic, shade grown—and socioeconomic criteria—fair trade).**

In both cases, the differentiation represents an added value to the product with a consequent perceived price difference, with prices higher than those prevailing in the standard commodity market. **The price will vary according to the type of differentiation, the certifications acquired, and the structure of the GVC, among other factors.**

Differentiation emerges, therefore, as an alternative strategy for producers to add value to the product and to achieve a greater share of the final income generated in the production chain (Lewin, Giovannucci, and Varangis, 2004).

In Brazil, the drop and volatility of prices, the overproduction crisis, and the concentration of most of the total income generated within the chain in the consuming countries constituted a stimulus for the producers to move toward differentiation.<sup>39</sup>

On the other hand, liberalization allowed roasters like Illy, who needed a high-quality Brazilian coffee for its blend and was having difficulties in finding it after the crisis, to come to Brazil with a complete new sourcing strategy, characterized by a closer relationship with producers and the development of their own structure in Brazil, in order to directly coordinate the tasks related to technological transfer, quality management and control, and packing and transportation, ensuring that the quality would be guaranteed from the first to the final player in the chain. With Illy, Brazilian producers encountered for the first time concrete incentives to switch to a focus on quality. In fact, it can be affirmed that, initially, the differentiation in Brazil was a roaster-driven process, influenced mainly by Illy's action. Illy's initiative, however, was then followed by other international roasters and traders and, as we may see, also fostered the development of producers' initiatives (mainly in the form of associations and cooperatives) that actually play an important role in the development of differentiated-market coffee in Brazil.

Market liberalization has, therefore, enabled the development of a differentiated coffee market, as it made possible price differentiation and the establishment of increasingly closer forms of coordination between the buyer pole (roasters and traders) and the seller pole

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<sup>39</sup> Moreover, the low rate of consumption growth of the commodity coffee in the main consumer countries and the appearance of new consumption patterns related to a differentiated product constituted other factors that led to the development of differentiation in a friendlier institutional environment.

(producers and exporters), which in turn allowed for the definition and assurance of the characteristics of differentiated coffee.

The value chain of coffee as a commodity, in general, has the presence of a large number of intermediaries between the buyer and the seller pole (such as the cooperatives, agents, national traders, exporters, and international traders and brokers) performing different activities, from product processing to commercial intermediation, according to the commodity standards.

The access to this new differentiated coffee market, however, imposes new tasks, such as the learning of new know-how and production techniques, the necessity of compliance with standards of quality and sustainability, marketing techniques, new commercial channels, the implementation of mechanisms to signal quality and sustainable practices, and often, certifications.

In this context, if, from one side, the supply chain tended to become shorter with the elimination of some intermediaries (such as agents and local and international traders), on the other side, other intermediaries have emerged with a key role in promoting Brazilian producers' access to the supply chain and the international market.

The processing of differentiated coffee is predominantly performed by the producers or by specialized cooperatives, and not by agents or regular cooperatives, in order to achieve the special standards required. In order to define and assure the characteristics of differentiated coffee, the commercialization of the product tends also to be made more directly, from the producer to the roaster, or through specialized cooperatives, associations, and traders. On the other hand, new tasks (such as specified standard creation, quality analysis and control, signaling quality, certifying, knowledge transfer, etc.), crucial for this new market, started to be performed by other intermediaries.

Significant examples concern the new functions performed by producer associations which, capturing the nature of the new challenges that have to be faced by producers to access this new market, have adapted their roles and activities to better meet the needs of their members.

While it was the case that during the ICA regime their main function was to offer information and negotiate their members' interests with the states, after market liberalization they dramatically changed their role: from direct co-regulators they became service providers and strengthened their role as intermediaries along the supply chain. They filled the gap left by the state and by the government and started to participate in activities fundamental to the

agribusiness system coordination, seeking to guarantee products' quality improvement and the implementation of differentiation strategies.

One remarkable example is the Brazilian Specialty Coffee Association (BSCA) that, as in the aeronautics sector, has Apex-Brasil as its development partner.

BSCA is part of one of the eighty PSI developed by Apex in cooperation with sectorial associations.

**Apex develops two PSI concerning the coffee sector.** The first is called Brazilian Coffees, and its objective is to promote the export of industrialized Brazilian coffee with a higher added value, as well as increase the Brazilian export basis. The targets of the project are the Brazilian companies that export industrialized coffee and the Associação Brasileira da Indústria de Café (ABIC), which is the main civil entity partner of Apex in this project.

The second project is Brazilian Coffees—Special Beans, developed in partnership with BSCA. The main objective of this program is to improve the image of Brazilian coffee in the international markets, as well as promote the added value in the productive processes of Brazilian coffee. The targets of this project are the small and medium high-quality coffee producers in Brazil (Apex-Brasil website).

The BSCA was created in 1991 with the specific aim of supporting and promoting high-quality coffee production in Brazil. It is a sectorial association that represents most of the actors that operate in the high-quality coffee market in Brazil, including coffee producers, cooperative, roasters, exporters, and other associations.

Within the PSI program, the BSCA has carried out many activities such as **(1) technical training and knowledge transfer for the qualification of its members; (2) the development of joint marketing activities and the promotion of commercial channels between international traders and roasters and Brazilian producers through, amongst others, participation in international fairs; and (3) the creation and organization of a high-quality coffee competition, the Cup of Excellence, as part of its international marketing program for the promotion of Brazilian special coffees,<sup>40</sup> amongst others.**

It is important to note that the BSCA is also responsible for the development of **(1) its own quality standards; (2) a special classification system, largely adopted and**

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<sup>40</sup> The organization of the competition has the support of the Ministério da Agricultura, Pecuária e Abastecimento (MAPA), Apex-Brasil, and of the NGO Alliance for Coffee Excellence (ACE). Currently, the BSCA organizes the competition only in Brazil, but through a partnership it has allowed ACE to use the brand Cup of Excellence and organize the competition at the global level.



recognized;<sup>41</sup> (3) a quality-control structure; and (4) its own certification scheme, which is the only product certification for high-quality coffee in Brazil.<sup>42</sup>

Another significant example of coffee producers association is CACCER—Council of Coffee Growers' Associations of the Cerrado Region—that was created with the aim of supporting the Cerrado region's high-quality coffee production<sup>43</sup> (Jayo and Saes, 1997).

**The main activities performed by CACCER are: (1) the creation of the Café do Cerrado trademark and their own quality classification system; (2) the management and promotion of the marketing of the Cerrado region coffee through, amongst other activities, participation in international fairs; (3) the direct exportation of the high-quality coffee produced in the region, eliminating other intermediaries; (4) the provision of technical training and commercial advice for coffee producers; and (5) the development of scientific research in the coffee sector in partnership with research institutes, universities, and private companies, among others** (Jayo and Saes, 1997). CACCER also played an important role in fostering the establishment of the certification of origin by the state of Minas Gerais (see Box 10).

### **3. FIRM AND LINKAGES SECTION—ILLYCAFFÈ AND DATERRA**

#### **3.1 Illycaffè (Illy) and its Sourcing Strategy in Brazil**

Illy, as mentioned before, is a traditional Italian medium-sized roaster specialized in the production of high-quality coffee. Illy has just one coffee blend with a high percentage (around 50%) of Brazilian coffee (Assicafé interview).

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<sup>41</sup> A classification methodology for high-quality coffee was developed around 1999 within a project called Gourmet Project financed by the International Coffee Organization, the International Trade Centre, and the UN Common Fund for Commodities with the aim to help five selected countries, among them Brazil, to receive better prices for their specialty coffee. The methodology consists of analysing the coffee drink's properties such as flavor, aroma, acidity, sweetness, aspect, body, and aftertaste. A grade between 1 and 100 is given to the coffee. Coffee is considered special when it reaches a grade equal to or higher than 80 points (Interview with Vanusia Nogueira, BSCA). <http://www.cupofexcellence.org/WhatIsCOE/OurHistory/tabid/148/Default.aspx>.

<sup>42</sup> Although it is a product certification, the BSCA requires that the farm have at least one production-process certification, based on social or environmental criteria, ensuring that the production of the certified coffee meets minimum criteria of sustainability. The association only certifies the coffee of its associates. The coffee has to receive a grade above 80 points in the BSCA classification table by four distinct classifiers to be considered a special coffee and therefore be able to receive the BSCA label.

<sup>43</sup> From the moment that the Cerrado region producers started to win several coffee-quality competitions (the majority of them organized by Illycaffè), they realized they could organize themselves for the creation of instruments to explore and protect their comparative advantages. CACCER was created to give full support to the Cerrado region's high-quality coffee production (see also Café do Cerrado website).

At the end of the 1980s, Illy was experiencing major difficulties in finding the quality of Brazilian coffee they needed through traders. Therefore, the company decided to go directly to Brazil to observe how the Brazilian market structure was organized.

Illy's chairman, Mr. Ernesto Illy, was surprised with the high quality of the coffee cherries he found in Brazilian farms, but they were not being properly harvested and processed. He realized that the problem of Brazilian low-quality coffee was mainly in the coordination of the activities—harvesting, processing, and commercialization—and in the lack of incentives that Brazilian producers had to invest in a high-quality production (Saes, 2008).

Hence, with the aim of stimulating the production of high-quality coffee and of helping to identify its producers, Mr. Ernesto Illy decided to promote a coffee competition.<sup>44</sup>

The first competition occurred successfully in 1991, after which Illy decided to continue with this strategy and also to change completely its sourcing policy in Brazil.

The strategy adopted by Illy in Brazil was based on three pillars: (1) an award for the best coffee beans; (2) a price differential to reward quality; and (3) a direct relationship with farmers (Hagel, Seely Brown, and Davison, 2010; Andriani and Herrmann-Pillath, 2011).

The award for the best coffee beans and the price differential to reward quality had as their goals the attraction of producers and the creation of economic incentives to encourage them to switch to quality. In addition to the premium for the producers selected in the competition (a determinate amount of money according to the rating of their coffee),<sup>45</sup> Illy also adopted a general price policy, paying around 35%<sup>46</sup> higher than the price of standard coffee.

Based on the third pillar, Illy decided to eliminate the old intermediaries (agents, local and international traders, and, in some sense, the cooperatives) and only buy coffee directly from the producers, focusing on creating a long-term relationship. All coffee-selling contracts are signed between Illy and the coffee producers only.

However, it is important to note that while traditional intermediaries were eliminated from the GVC, new ones have been created, and also former intermediaries started to participate in Illy's value chain with different and important functions.

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<sup>44</sup> The idea of the competition came from a quality silk competition that had been promoted by the Ermenegildo Zegna brand for the same purposes (Ishikawa and Saes, 2006).

<sup>45</sup> Since the first year of the competition, Illy has recognized more than one thousand producers, and distributed more than R\$ 4 million.

<sup>46</sup> Illy used to pay the same price for all producers, updating it at the Porto de Santos website daily, established at around 35% higher than standard coffee's market price. From 2011, however, the price policy has changed and is now negotiated individually with each producer.

### 3.1.1 Illy's Structure in Brazil

Illy was aware that simply encouraging producers to switch to quality was not enough. The switch to special coffee markets involves ensuring compliance with transnational standards and new chain-specific quality criteria, processing technologies, certification schemes, etc. Thus, without an entirely new structure of accessing and disseminating information, Illy's strategy would not be possible.

As the Brazilian structure already in existence was based only on the commodity coffee model, Illy created, directly or through partners (new intermediaries), a completely new structure, with transactional practices more appropriate to the requirements of the high-quality coffee market.

Illy was, therefore, successful in consolidating long-term contractual relationships with Brazilian partners that were first identified and established in order to aid the organization of the competition and then assumed the tasks of ensuring the supply of logistics according to Illy's quality parameters, and of strengthening the relationships with the suppliers.

It is important to mention that Illy establishes its own chain-specific quality standards, which have to be followed by the suppliers to ensure access to the GVC. The company does not require any kind of third-party certification from its suppliers and performs the quality control of the product itself through its network of intermediaries.

It is possible to distinguish between the structures created for (1) the organizing the competition and the supply of logistics and quality-control tasks; and (2) strengthening the relationship with suppliers (see Figure 9):

*1) Competition organization and supply logistics and quality-control tasks*

**a) ADS Assessoria de Comunicações (ADS) —The marketing company**

ADS was the partner selected to help Illy with the creation and organization of the annual coffee competition.

**b) Assicafé Assessoria e Consultaria Agrícola (Assicafé)—The quality-analysis laboratory**

To be able to select coffee with the desired quality, in 1992 Illy fostered the creation of a quality-analysis laboratory. Working exclusively for Illy, Assicafé's function is to

provide analysis of the coffee sent by the producers in order to select those that meet Illy's specific quality standards. They also select the best samples for the award.

**c) Porto de Santos—The exporter**

Porto de Santos was the partner that Illy found to provide all the exporting logistics for high-quality coffee purchased directly from the producers. They initially had a contract of exclusivity, and in 2006 Illy bought 51% of their shares, acquiring control. Porto de Santos only exported coffee indicated by Illycaffè after the analysis by Assicafé.<sup>47</sup>

*2) Strengthening the relationship with suppliers—Technical Knowledge Transfer*

**a) Universidade do Café Brasil—Unilly**

The Unilly is a public-private partnership between Illy and University of São Paulo. It was formed with the intention of training the producers and transferring the know-how needed for the cultivation of high-quality coffee. Together with Illy's Club, it represents the "innovation and knowledge" system of Illy's structure.<sup>48</sup> As already mentioned, Unilly performs its activities in partnership with local cooperatives and associations that work as spreading channels (Universidade do Café Brasil—Unilly website).

**b) Clube Illy do Café—Illy's Club**

Illy's Club is a loyalty program created in 1999–2000 with the objective of offering Illy's suppliers a number of advantages in different affiliation categories, based on the number of years and continuity of the supply.<sup>49</sup> Among the benefits are: (1) free participation in Unilly courses and seminars; (2) stamps to identify "preferential samples" to prioritize the analysis of the samples sent for the buying procedure; (3) a technical visit by an Illycaffè's consultant, etc. The club was designed to establish a closer relationship between Illy and its suppliers due to the increasing competition in the market over recent years.<sup>50</sup>

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<sup>47</sup> In March 2012, the partnership between Illycaffè and Porto de Santos ended with Porto de Santos acquiring the 51% of the shares owned by Illycaffè.

<sup>48</sup> Two different types of knowledge flow through these channels: first, technical and scientific knowledge, mainly related to coffee growing and acquired in central labs (learning-by-researching), which is spread in a top-down fashion to suppliers; second, the channel helps diffuse "best practices" acquired in a bottom-up fashion (Rauscher and Andriani, 2009; see also Clube Illy do Café website).

<sup>49</sup> Illy's Club is composed of four different affiliation categories: red, silver, gold, and platinum, into which producers that have sold coffee continuously for one, three, four, and ten years respectively are allocated. Volume of sales (number of coffee bags sold) is not relevant for classification in order to ensure equitable treatment among the small, medium, and big producers.

<sup>50</sup> After ten years of promoting quality coffee production in Brazil, other multinationals and importers turned their attention to the Brazilian differentiated coffee market. Competition was increasing, as many other roasters were moving toward quality as a means of reaching an expanding market.

To be part of Illy's Club, a producer must sell coffee to Illycaffè at least once, and has to continue to sell to Illy in order to remain in the club. Illy does not require exclusivity of its suppliers, because Illy does not guarantee the regular acquisition of the product, as all coffee needs to pass through the selection procedure to be acquired.<sup>51</sup>

### 3.1.2 Spillover Effects

Illy's presence in Brazil made a major impact on the Brazilian coffee sector, influencing new initiatives directed to coffee differentiation, most of them unintended.<sup>52</sup>

(1) First of all, Illy's award created a competition dynamic between the different coffee-producing regions, promoting quality improvement in all of them. The award revealed several good quality-producing areas that were previously unknown, such as the Cerrado region in Minas Gerais state. Illy's initiative promoted the sector's self-knowledge development: distinct producing regions started to focus on their differentiation potential.

(2) A second significant result of Illy's presence and influence was the creation of the Café do Cerrado trademark by CACCER. As already mentioned, this association is a **new intermediary**, and is very important for the development of the differentiated coffee market in Brazil and in helping Brazilian producers gain access to new international markets. In 1995, through CACCER's efforts, the Cerrado Mineiro region also became the first growing region to receive Geographical Indication (GI) status in Brazil (Cooperativa dos Cafeicultores do Cerrado—Expocaccer website).

(3) A third effect was the emergence of quality coffee competitions in many different coffee-producing regions, such as the Cup of Excellence created by the BSCA.

(4) A fourth impact of Illy's presence in Brazil was the introduction of new transactional practices more appropriate to the requirements of the high-quality coffee market. Illy transferred knowledge to the suppliers about the demand side, triggering a learning process toward high-quality production. Illy's transaction regime created human,

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<sup>51</sup> Illy's procedure to buy coffee can be summarized in four steps: (1) Illy establishes its shopping parameters for the buying season, which are published through Porto de Santos; (2) producers who believe their product matches the quality standards requested send their coffee samples to Porto de Santos; (3) Assicafé makes the quality analysis of the samples, following the priority order established by the Illy's Club preferential stamps, and determines which coffee lots reach the company standards and can be bought, and which do not; (4) Porto de Santos signs the contract directly with the producer and delivers the product to Italy.

<sup>52</sup> According to Ernesto Illy: "The impact of our initiative has been much greater than what we had foreseen. We simply wanted to solve our problem but, in fact, we changed the mentality of the Brazilian market. The number of people who take part in this event, which is causing a great stir, is steadily increasing" (Andriani and Detoni, 2008).

organizational, and social capital, which was then implemented in the structuring and consolidation of other supply chains.

(5) Lastly, Illycaffè's strategy in Brazil helped to change the image of Brazilian coffee in the international market. Big MNCs that were not buying Brazilian coffee, on the assumption that Brazilian coffee was standardized and of low quality, started to consider Brazil as a potential supplier of quality coffee. Nowadays, companies such as Starbucks and Nespresso purchase large quantities of Brazilian high-quality coffee.

It is possible to conclude that Illycaffè was a pioneer in structuring the Brazilian high-quality coffee market on the basis of new techniques and transactional practices, opening up access to international markets.

The establishment of trust between a limited number of growers and Illy created the initial conditions for an epidemic of imitations, which continuously accelerated the transition to the new de-commoditized regime (Andriani and Herrmann-Pillath, 2011). Many cooperatives (such as Cooxupé) and associations (such as CACCER and BSCA) are now working on the promotion of quality coffee production among their members, and are trying to develop competencies to act as new intermediaries and help their members access the differentiated market's GVC.

Among the many Brazilian producers that were influenced by Illy to switch to quality and gain access to the international market of differentiated coffee is Daterra.

### **3.2 Daterra**

Daterra Atividades Rurais Ltda. ("Daterra") is a limited partnership specialized in the production of high-quality and sustainable coffee. Daterra was created by the owner of a tire company (DPaschoal), on the basis of a government incentive to invest in reforestation and on the company aim to invest in an "eco-friendly" project. After some years in the field of reforestation and several other agro activities, Daterra began to deal with coffee production with a small farm of standard-quality coffee in São Paulo state. At the beginning of the 1990s, however, Daterra decided to focus its agribusiness activities only in one sector, choosing coffee (Daterra interview).

The choice for the coffee sector was made on the basis of the precise parameters delineated by the DPaschoal company, such as: (1) the possibility to develop innovative research in the field in partnership with research centers; (2) a human capital-intensive sector (in order to promote social well-being through rural production); (3) a product that had a stable

market and could even be 100% exported; (4) a sector that allowed the company to have a voice in the market, being one of the ten biggest producers in Brazil; and (5) a sector in which the main producing areas would not be far from Campinas, where DPaschoal is located.

As a result, they bought a larger coffee farm in the Cerrado Mineiro region (Patrocínio).

During the initial years of production, Daterra produced coffee only for the commodity market, despite their efforts to develop production based on sustainable criteria.

As mentioned above, during this period, just after the liberalization of the coffee market, the strategy of differentiation was just beginning in Brazil.

### **3.2.1 Daterra and the High-Quality Coffee Market: Illycaffè's Impact on Company Strategy**

Daterra's farm is located in one of the best regions in terms of geographical and climatic characteristics for high-quality coffee production. In 1993–1994, Daterra's managers witnessed the impact of the Illy competition within the Cerrado region. The winners of the first prizes were all from the Cerrado region, and the producer association (CAC CER), as mentioned before, mobilized to create the Café do Cerrado trademark and also to promote the registration of the region's Indication of Origin.

In this way, Daterra's managers entered into contact with the world of high-quality coffee, witnessing the work of Illy and the successful marketing done for the coffee of the Cerrado region.<sup>53</sup> Daterra's chairman (Mr. Norberto Paschoal) also had the opportunity to meet Mr. Ernesto Illy personally, through the Carvalhaes exporter, and was able to learn about his work in Brazil and his interest in coffee research.

After these experiences, Daterra decided to change its production system and differentiate its product through quality in addition to sustainable criteria.

Illy was important in introducing Daterra to the quality-coffee world. Illy passed along to the Brazilian producers extremely important concepts: (1) coffee is not a homogeneous product—there are various types of different-quality coffee, which must be valued accordingly; and (2) product differentiation is determined by a series of factors, such as the

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<sup>53</sup> “From the middle to the end of 1994, something happened. I received an invitation from a club in Patrocínio to attend a coffee event and I accepted it . . . Well, the reason was to announce that they would launch, on this day, the brand Café do Cerrado . . . This was organized toward marketing, but stirred everyone, since nobody knew what the Cerrado was. They would say: “from now on, the coffee from the Cerrado Mineiro will be known” (Interview, talking about the ceremony for the launch of the Café do Cerrado trademark).

kind of coffee that is planted and the care in farming, harvesting, processing, storage, and transporting.

Therefore, Illy presented Daterra with the first stimulus to migrate to the quality-coffee market as its first buyer. For many years the company accessed the international market of high-quality coffee **exclusively through Illy**. From 1995 until 2000, it sold practically all of its high-quality coffee (around 35% of its entire production) to this MNC. The rest of Daterra's coffee production consisted of commodity coffee sold to Brazilian exporters working in the traditional commodity market.

Despite the long-term relationship, contracts between Illy and Daterra, as with all other coffee producers, were formalized only if and when the samples were approved by Illy's quality-control system during the selection process.

However, the relationship between Daterra and Illy went beyond the domain of the standard supply relationship in accordance with Illy's supply structure as established in Brazil. In 1997, the companies signed a joint venture contract to develop common genetic research and new varieties of coffee. Daterra's managerial competences and interest in innovation seemed to be crucial for the establishment of the research partnership.

The project also encompassed the collaboration of the IAC (Agronomic Institute of Campinas) and resulted in the development of some new varieties of coffee, such as "Mundo Novo—natural cross pollination of Sumatra and Bourbon in Brazil; Red and Yellow Icatu—back cross of Bourbon and Canephora Tetraploid; Red and Yellow Catuaí—back cross between Mundo Novo and Caturra" (Daterra website).

Currently, the two companies do not invest in joint research activities, even though their joint venture contractual relationship has not been officially terminated.

### **3.2.2 Daterra Directly Accesses the Global Market and Develops Its Own Supply Chain**

During the last decade, Daterra has been putting into practice all of the knowledge acquired from the beginning of the company's operations and especially its knowledge regarding high-quality coffee. The company noticed that high-quality coffee was not a homogeneous category, and that different quality characteristics were valued in different ways. Furthermore, the market of production process-differentiated coffee based on sustainability criteria has also emerged as a good opportunity.



As has already been mentioned, Illy adopts a hybrid chain-specific classification system, which includes some of the Brazilian official classification system criteria based on coffee defects. Until 2010, Illy used to establish one single price, a percentage over the New York Coffee Exchange market price, for all the coffee that reached (or surpassed) its chain-specific parameters.

However, the international market of special coffee offers great price differentiation opportunities through quality, and there are many classification systems, such as the BSCA and the Specialty Coffee Association of America (SCAA). In both, the coffee can have a grade from 0 to 100 points. A coffee that achieves 80 points is considered “special.” Nevertheless, the price of a 90-point coffee can be much higher than a coffee of 80 points. On the other hand, as already mentioned, coffee produced by different criteria, especially if certified, has an increase in price, but that is normally not recognized by Illy.

Due to some disagreement concerning pricing criteria, Datterra decided to access the international market directly and to establish a commercial relationship with other specialty coffee buyers around the world.

Datterra now sells just a small amount (around 1,000 coffee bags) of its total production (estimated to be around 70,000 coffee bags) to Illy and participates in its loyalty club in the highest category.

The independent internationalization strategy of Datterra was constituted by a variety of measures that we now analyze:

### **1—Capacity of investment in research, development, and learning**

Datterra, since the beginning of its activities, made large investments in research and in new technologies to develop its production system and improve the quality of its products. Among its many investments was the creation of their own laboratory of quality analysis and control, the development of a traceability system to map the quality and production condition of each coffee lot produced, and the creation of the innovative Penta System that comprises a set of technological procedures to ensure quality consistency from the planting, harvesting, drying, processing, and sorting to the warehouse and packing. Datterra even invested in the creation of new and innovative machinery such as one that allows the separation of coffee beans by maturity level, and the dry peeling of coffee in great quantity.

It is important to mention that the investment was made possible because of the financial support that DPaschoal Group offered to Datterra. In fact, the research financing

came from resources of other companies within the group, which regularly invest a share of their profits in Datterra's projects.

Regarding the knowledge transfer from Illy to Datterra, according to Datterra, the role of Illy was very important, especially in the beginning of its activities, to indicate to Datterra the existence of another approach in the production and commercialization of coffee, an approach that was focused on quality. Through courses, seminars, and conferences provided by Illy to the coffee producers, Datterra learned ways to improve production.

However, a significant role was also played by the BSCA. Illy does not teach its producers, not even Datterra, the precise characteristics that have to be valued in the drink and how to perceive them.<sup>54</sup> It was, therefore, only through the BSCA and its classifiers that Datterra had the opportunity to learn how to identify and individualize the characteristics of a high-quality coffee.

Illy's stimulus and the subsequent support of BSCA allowed Datterra to develop very precise classification and identification systems of its own product. Currently, the precision of Datterra's production of differentiated batches of high-quality coffee, with the mapping of the different characteristics of each of them, gives Datterra an important market advantage, maintaining a good position of price negotiation and selling conditions.

## **2—Finding and consolidating international commercial partnerships in the high-quality coffee market**

From 2000, Datterra started to develop a series of initiatives to identify clients that valued quality and sustainability, in order to find a way to structure their own distribution channels.

In this process, the role of the BSCA as an intermediary was of significant importance. As already mentioned, the BSCA had a fundamental role in helping its associates participate in international fairs, an approach which was considered, as in the aeronautics sector, one of the main strategies to meet new clients and sign new contracts. Today, Datterra has its own stand at international fairs, bearing its costs independently, even though its first appearances were through BSCA, which was responsible for teaching the company all the dynamics of

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<sup>54</sup> This prevents those that have their coffee approved by Illy and that win Illy's prizes from knowing exactly the evaluation criteria and the reasons for their success. The producers work blindly, to an extent, and those that obtain good results in the selection process and through Illy do not know how to repeat the same performance since they don't have access to, and can't master, the important criteria in order to promote them in the production process.

international fairs and also how to undertake the marketing of the product in an international environment.

Daterra also makes great investments in the marketing of its products. This activity generates positive externalities in relation to the national coffee production because the company has been consolidating itself as a great producer of high-quality coffee, with the employment of more advanced technologies, always within patterns of social and environmental sustainability. Daterra positively adds to the Brazilian coffee image because it represents the opposite of the commodity production that was traditionally associated with Brazil.

Marketing and the search for new clients allowed Daterra to form very stable commercial relationships with traders of differentiated coffee in the main consumer countries in the world.

### **3—Eco- and socio-sustainable production and certifications**

Since the beginning of its activities, Daterra always aimed for an eco- and socio-sustainable production. This position became important, together with the high quality, to differentiate its products.

Daterra has obtained several sustainability certifications, such as Utz Kapeh, Rain Forest Alliance, and ISO 14001. Daterra is also certified by GlobalGap, an institution founded in Europe to provide a set of normative documents establishing standards and procedures for the global certification of Good Agricultural Practices (GAP).<sup>55</sup> One of the most important issues for this certification is the careful control of agrochemicals and total traceability.

### **4—Financing, management capacity, and entrepreneurship**

Another important factor for Daterra's growth was its ability to access many sources of financing and presenting conditions that the financing institutions could trust.

Daterra divided the investment necessities along several fronts, allocating the financial resources in a planned manner, both from its own funds and from third parties:

- (i) DPaschoal Group—The resources of DPaschoal Group were used to acquire land and to finance the infrastructure of farms and research costs.
- (ii) BNDES—The BNDES resources were used to finance equipment: machines, tractors, harvesters, etc.

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<sup>55</sup> <http://www2.globalgap.org/about.html>.

- (iii) International Finance Corporation (IFC)<sup>56</sup>—The financing from the IFC was used for planting.
- (iv) Fundo Rural—The resources from Fundo Rural were used to finance the crop.
- (v) Exchange Contract Advance (ACC)<sup>57</sup>—Export line of credit.

For most of coffee producers, the difficulties of obtaining credit are usually linked to the lack of guarantees that they can offer to credit institutions or because of the existence of unpaid loans due to the variation of price in the commodity coffee market. Datterra was able to use the credit worthiness and equity of DPaschoal Group, allowing them to secure cheaper credit.

Another obstacle for small producers is the lack of capable financial management; the producers can't design and execute the necessary planning for the efficient management of their debts. Datterra initiated its activities with the management culture of DPaschoal, knowing how to establish and execute long-term financial planning, incorporating into the company the value generated by good financial practices, and knowing how to generate income to pay their debts.

A final question that hinders coffee producers in modernizing their production is the difficulty in comprehending the market logic of the differentiated coffee. The culture among the producers is starting to change on a bigger scale, in the sense of perceiving the advantages of adding value to the product and the profit that investment in better production techniques may generate, in contrast with the logic of the market of coffee as a commodity. Datterra always had an entrepreneurial attitude, focused on differentiation. The company is controlled by administrators driven by the pursuit of modern production techniques and always connected with the market trends in the sector.

### **3.3 Illycaffè and Datterra: Two interconnected paths**

Illycaffè arrived in Brazil and consolidated its own supply structure with the objective of solving its own high-quality supply problem. The company's actions stimulated several coffee producers to invest more in high-quality coffee production. The coffee competition and

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<sup>56</sup> “IFC, a member of the World Bank Group, is the largest global development institution focused on the private sector in developing countries. It creates opportunities for people to escape poverty and improve their lives. It does so by providing financing to help businesses employ more people and supply essential services, by mobilizing capital from others, and by delivering advisory services to ensure sustainable development” ([http://www1.ifc.org/wps/wcm/connect/CORP\\_EXT\\_Content/IFC\\_External\\_Corporate\\_Site/About+IFC/](http://www1.ifc.org/wps/wcm/connect/CORP_EXT_Content/IFC_External_Corporate_Site/About+IFC/)).

<sup>57</sup> Export finance with the objective of supporting the production of goods in the pre-shipment phase. The resources for the ACC are raised from bankers outside of Brazil and are passed to Brazilian banks that then finance Brazilian exporters.

the feedback related to the best production techniques, even though it didn't encompass the totality of relevant information regarding the characteristics associated with the quality of the drink, constituted important factors of knowledge transfer, initiating coffee producers in a new production and trade paradigm.

Daterra is a coffee-producing company created by experienced businessmen, engaged in the tires sector. As mentioned above, a governmental program of forestation incentives fostered its creation. Daterra is the result of good industrial, financial, and marketing practices implemented in the agricultural field.

Daterra's learning process was conducted, at least at the beginning of its activities, by the commercial relationship established with Illycaffè. Because Daterra had good managerial practices and its own capital, the company was able to take advantage of the directions and indications given by Illycaffè in order to develop its own quality concept and to establish its own consumption market in an independent way.

Daterra, building on the knowledge and ability developed in the relationship with Illy, was able to develop its own production process, technology, marketing, and transactional competencies. It then went on to access the international market directly without intermediating through MNCs.

It is necessary to point to the role of BSCA in Daterra's development. The association had a relevant role both in knowledge transfer regarding the technical aspects of drink quality and on the commercial insertion of Daterra in the international market of quality coffee.

Today, Daterra is one of the biggest coffee producers in Brazil, having 100% of their properties certified on the adoption of sustainable environmental, social, and economic practices.

The company currently maintains an independent scheme, exporting its coffee directly to clients with whom they have long-term contracts and also working on the product brand through their own actions (such as the development of a classification system associated with its brands and individual presence at international fairs). Notwithstanding this independence, the path of the company encompassed the actions of many agents exercising an "intermediary" role, such as Illycaffè, BSCA, and the financing agencies (BNDES IFC, Fundo Rural, etc.).

In addition to these two cases of supply-chain organization, with the elimination of intermediaries in Daterra's case and the consolidation of exclusive intermediaries with some

vertical integration in Illycaffè's case, there are many other situations in which intermediaries play an important role in transactions between differentiated coffee buyers and sellers.

Although Illycaffè and Daterra have improved their production-process techniques and established their own commercial network predominantly on the basis of their own resources, it is important to note that associations and cooperatives have been changing their roles and trying to create the necessary structure to also allow small producers that do not have the resources and capacity of Daterra to achieve a high-quality production standard and to access the international market of differentiated coffee independent of Illy.

Cooperatives may be very important for smaller producers, providing services of preliminary quality analysis, access to the international market, and help in the certification process. In the same way, associations like the BSCA, also through the partnership with Apex-Brasil, not only had a significant importance for Daterra, but are also one of the main players to help small and medium producers to access the international market of differentiated coffee. The CACCER initiatives (such as the Café do Cerrado trademark, and the promotion of the geographic indication with the support of the government of Minas Gerais) are also of great importance.

## IV—COMPARATIVE ANALYSIS

The investigated supply chains have been highly influenced by market evolution in the respective sectors. Market liberalization has occurred in different ways in both the coffee and aeronautics fields, followed by higher concentration of MNCs, especially in aeronautics, and significant outsourcing.

GVCs create opportunities for SMEs to access new technologies and innovation and to enter new markets. Opportunities, however, are not easily accessible and the GVC's leader makes entry and exit very selective. Governments and private intermediaries, often acting cooperatively, promote access via policies that provide services and finance growth opportunities.

The case studies show that the access to GVCs by local firms is the outcome of a combination of factors whose governance belongs to different actors. Access has been made possible or easier due to the process of liberalization and higher competition followed by market concentration. Contractual clauses and regulatory devices may increase specific investments of SMEs to access the chain and make exit more costly by forbidding the use of know-how outside the chain. Contractual practices have contributed to redefine the supply-chain structures by designing a more rigorous and less arbitrary regime to access and exit the GVC. More formalized and written (rather than oral) contracts contribute to stabilize relationships and foster cooperation between enterprises. This conclusion contradicts the often-repeated assumption that informality increases cooperation along the chain.

To determine at which point of the GVC entry should occur is relevant to quantify the potential expected benefits. The aeronautics GVC suggests that there are at least three levels, each one characterized by a series of contractual arrangements. The first, closest to the MNC, is that of risk-sharing, where a partner of the MNC bears some risks concerning the commercial success of the final product (the airplane). Risk-sharing is often associated with co-making and a strong involvement of the firm in the production design. The second level is that of supplier, where risk is allocated *ex ante* between the two parties, and there is little or no risk-sharing and some degree of co-design. The third level is that of subcontractor. Often in this case there is no direct contractual relationship with the MNC. The relationship is mediated by the supplier and the benefits of accessing the GVC are "filtered" by the intermediaries. The entry location in the supply chain may determine the degree of expected benefits, which tend to diminish the further the firm is from the MNC.

Furthermore, access to GVCs is often conditional upon meeting certification requirements, both international and domestic. The increasing role of certification characterizes, for different reasons, access to both supply chains. In particular, when certification is firm-specific or country-specific, it increases both entry and exit costs because it multiplies the requirements suppliers have to comply with. The role of certification does not stop at the entry level but accompanies the entire cycle of participation in the supply chain. Certifiers represent, together with other actors, new intermediaries along the chain, which contribute to the redefinition of contractual monitoring of firms' performances. They design coordination systems that ensure control but also redistribute knowledge. Lack of compliance with certification can cause forced exit from the chain.

The case studies provide evidence that:

- (1) There is a strong correlation between market structure and supply-chain evolution. Higher level of market concentration can correlate to outsourcing rather than vertical integration. Evidence, especially in aeronautics, shows that both internal and external outsourcing has taken place at the global level and both global MNCs and local suppliers (SMEs) have benefited from this trend. However, benefits have not been equally distributed along the chain, and SMEs have more difficulties than MNCs in upgrading within the supply chain. It is too soon to speak about co-evolution between market and supply-chain structures, but the evolutionary relationship between market structure and shape of the chain is worth exploring more in-depth.
- (2) Contractual practices affect the structure of supply chains and the relationship within. A higher degree of coordination among firms along the supply chain has been adopted/stimulated by the leader, thence defining different types of subcontracting relationships on the basis of risk-sharing levels that correspond to different revenues and loss-sharing along the chain. This is more formalized in the aeronautics GVC, but it also exists to some degree in the coffee GVC. The Brazilian legal system reduces the possibilities to deploy international contracts and stimulates the use of contracts under domestic legislation. To what extent the current legal framework is adequate to provide sophisticated contractual practices along the supply chain is to be further explored.
- (3) The GVC is influenced by the presence of public and private intermediaries, which, depending on local factors and public policies, hinder or promote access by SMEs and define thresholds within the GVC. Both Datterra in the coffee industry and Grauna in



the aeronautics industry, constitute good examples of firms whose role in the supply chain has changed over time, due also to the presence of new intermediaries. The role of HTA, promoted by Apex-Brasil, in the field of aeronautics has made foreign supply chains accessible to Grauna and other firms. While initially the consortium was envisaged to play a much stronger direct role, it ended up instead having the function of an intermediary, with foreign firms establishing supply contracts directly with the individual firms. Later, the policy shift decreased direct involvement and increased delegation to CECOMPI. The goals of the collaborative agreement between Apex and CECOMPI are clearly stated: “the commercial promotion of the ‘Brazilian Aerospace Cluster’ through the competitive insertion of the firms of the aeronautics supply chain and increase their capacity to export and the diversification of products” (PDP, 2010). The role of BSCA in the differentiated coffee sector is contributing to the growth of the high-quality market in Brazil and providing opportunities for SMEs to directly access foreign markets and international supply chains. The institutional design concerning intermediaries is quite weak and the legal regime of consortia, without legal personality, forces them to resort to byzantine architectures using nonprofit models combined with companies.

- (4) Domestic public policies supporting SMEs’ access to GVCs have changed over time. The first turn was certainly represented by market liberalization with the creation of regulatory agencies at the beginning of the 1990s. The role of Apex, ABDI, and BNDES has been highly influential, though their approaches have not been always consistent with one another. They have influenced both the incentives of MNCs to invest in Brazil and the opportunities for Brazilian SMEs to access international markets. In both circumstances they have tried to support Brazilian SMEs’ growth along international chains via promotion of networks. In 2008, a turn toward sector-integrated projects (PSI) increased the level of partnership and delegation to associations in relation to projects implementation. Apex has strengthened this policy engaging into project design in collaboration with associations. Even within the last twenty years, these changes have contributed to the creation of new private intermediaries; CECOMPI in the field of aeronautics and BSCA in that of coffee certainly represent two significant examples. The objectives of the agreements between Apex and the associations clearly refer to the creation of networks for export as a development tool, reinforcing a perspective that has characterized Brazilian public

policy in the last fifteen years. To what extent this shift represents a radical or incremental stage of private involvement in public policy is to be further investigated.

The coffee case study presents a specific phenomenon worth exploring further: the creation of a differentiated market for coffee, where high quality, environmental sustainability, and certification have created new opportunities for Brazilian farmers and roasters. It concentrated in the region of Minas Gerais and then broadened. Local intermediaries like CACCER played a very important role in promoting growth and access to GVCs. Here, emerging economies are prevailing not over the production of standard goods but of high-quality goods in line with a more general trend. A new type of commodity, high-quality coffee, was initially promoted by a foreign MNC but was thereafter developed by Brazilian independent farmers, cooperatives, and producer associations with the support of public policy at the regional and national level. An MNC has brought ideas and strategies for the creation of a new market whose governance has lately been taken over by local firms, giving rise to the growth of new intermediaries that have contributed to the successful development of the new market and the leadership of Brazilian coffee. The strategy of Illy was driven by worldwide competition and the necessity to gain comparative advantage over the competitors. This strategy produced awareness and triggered competitive drivers that transformed the overall landscape with the creation of new bodies and the emergence of new leaders in the coffee market. Spillover effects of Illy's penetration stimulated the consolidation of a new market and new players who have become the driver of growth and introduced new dynamics within the supply chain.

In conclusion, the case studies suggest that access to GVCs might be beneficial for at least three reasons: it increases market opportunities, it improves access to new technologies, and it enhances regulatory capabilities.

## V—POLICY RECOMMENDATIONS AND CONCLUDING REMARKS

Access to GVCs represents a significant growth opportunity for local SMEs. Modes of access are highly context dependent on market structures and on the supply chains. They are also strongly influenced by market cycles. Access becomes more difficult and selective in time of crisis. The case studies show that modes of access are partly endogenously defined by the supply-chain leader and its position in the final market, and partly influenced by exogenous public policies. The MNC may define the structure of the chain and the requirements for partners to locate along the different tiers, as the case of Embraer, followed by other MNCs, clearly shows, when it distinguishes between risk partners, suppliers, and subcontractors. States can also have a strong impact by supporting local firms but also making MNC access conditional upon the involvement of SMEs, as the offset contract example demonstrates. But similar instruments can be deployed in other supply chains and especially in agriculture, where the specific commodity is a unique or scarce resource.

In both contexts, the role of intermediaries between the supply-chain leader and its partners is relevant. Intermediaries can facilitate the interaction but can also constitute barriers when they want to exercise full and monopolistic control over access. Intermediaries perform different functions: (1) they fill cognitive and informational gaps by helping MNCs select local partners and enabling local SMEs to contact and engage with MNCs; (2) they go well beyond cognitive intermediation, performing organizational tasks when they promote the creation of coalitions and networks of SMEs to access the GVC; and (3) they often provide direct services, training, financial and administrative support, and technical expertise. In some cases they even contribute to the creation of regional quality brands, becoming private regulators by setting up certification schemes and implementing them.

Often the size of local firms is too small to access GVCs. Pre-access growth strategies have to be in place and have to be addressed by public policies.

Different options have emerged in relation to policies fostering firms' growth to enable access to GVCs. The complementarity between growth through networks and through ownership integration emerges quite clearly in the case studies. The use of inter-firm networks, in particular horizontal networks in order to interact with suppliers and system integrators, has been explicitly promoted by Brazilian agencies and by BNDES. The creation of networks, both contractual and organizational, reduces MNC search costs, increases coordination, and permits a higher level of delegation by the MNC to suppliers, which in turn

can allow upgrading along the chain. The possibility in aeronautics to become a subsystem integrator, moving from subcontractor to supplier status or even to risk partner, depends on the ability to integrate different technical competences and to reach a higher level of financial consolidation.

The legal framework in Brazil and other Latin American countries appears inadequate. Domestic laws have recently introduced the contractual consortium deployed as a form of network to perform different functions. In particular, export consortia have been created to facilitate access to international markets and GVCs. However, lack of legal personality of consortia and other types of contractual networks has often forced the use of alternative architectures like that of nonprofit associations combined with limited liability companies. A related issue is that of knowledge diffusion along the chain and technological spillovers from the chain. Rules concerning development of innovative knowledge incorporated in Intellectual Property Rights (IPR) have to be designed in relation to collaborative network forms. For networks to be credible partners of MNCs, allocation of individual rights or management of collective rights needs to be integrated into the governance scheme before engaging in collaborative endeavors with other tiers of the chain. Poor IPR allocation mechanisms can reduce incentives to cooperate and increase ex post disputes.

We suggest a double reform: (1) at the domestic level, the introduction of a legal framework that permits the choice between contractual and company networks with legal personality and includes a regime for IPR that is created through collaborative work within the supply chain; and (2) at the transnational level, a model law that can foster the creation of inter-firm networks at the Latin American level in order to promote the creation of networks among SMEs of different countries. Often outsourcing includes location in several countries, and different legal forms force MNCs to fragment the process, thereby increasing transaction costs.

Public policies are needed to ensure that upgrading along the chain occurs. SMEs need services and competencies provision to be able to participate in the GVC. These policies are the result of interaction between public and private actors at both domestic and international level. International organizations may play a significant role in suggesting and promoting them. In some cases they can make domestic adoption of the policy a requirement to access loans and funds. This interplay suggests that public policies are only partially exogenous to the supply chain where the MNCs can negotiate FDIs directly with the state and with local

trade associations. In this case, they are driven by agreements made by MNCs when making investment decision about location.

The Brazilian experience suggests that both policy design and implementation are the output of collaborative relationships, ranging from delegation to the creation of public-private partnerships. Three major public actors contribute: government ministries, public and private agencies, and development banks. Modes of cooperation of these actors have changed over time, but it is clear that support of SMEs to access GVCs is the outcome of their interaction. Recent changes in export policies by Apex have increased the level of delegation of policy implementation to private bodies composed primarily, if not exclusively, of private actors. To some degree, this change has increased the separation between policy design and policy implementation. The success of this policy is determined by the strategic view of the delegated body and steering and oversight ability of the delegating entity.

A specific recommendation concerns the role of certification, given the increasing importance it has acquired in defining access to and position in a GVC. The proliferation of certification schemes is associated with the increasing relevance of transnational regulation in the organization of the supply chain (Cafaggi, 2011a; Cafaggi, 2011b). There is competition at transnational level that often translates into multiple schemes; emerging economies still play a modest role in their design, except when they are able to create new markets, often driven by sustainability and fair trade concerns. The case studies show that both international and domestic standards co-exist. Compliance with international technical standards, in particular ISO, is necessary to ensure access to international markets. These standards are both public and private, and the role of Latin American states and private actors in their design is unclear. It is important to support SMEs in complying with certification schemes and to develop local schemes in order to counterbalance the power of international certification schemes.

The case studies show, however, in particular with reference to the coffee industry, that creation of a high-quality market can become a key driver for internationalization. In this case, the importance of local certification is of high relevance as a signaling device for market players who want to import the product. Associations, with the support of Apex, have engaged in direct certification design and management and have helped SMEs to comply with international certification schemes.

The relatively successful Brazilian model of public policies for accessing GVCs can be replicated in Latin America, but a key variable to module transplants is the strength and the

independence of the domestic regulatory states. The degree of independence and, more specifically, the level of corruption, will be significant factors in determining the interplay between public and private actors in designing and implementing policies concerning GVC access by SMEs. The weaknesses of regulatory states suggest the creation of independent entities like development banks and regulatory agencies relatively insulated from the political system and can be made more accountable directly to market players and civil society.

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## **VI—APPENDIX**

### **1. AERONAUTICS SECTOR**

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## **3. LIST OF INTERVIEWS**

## 1. AERONAUTICS SECTOR

### Box 1. Offset Agreements

Offset agreements, common in governmental practices, are compensatory agreements made between the parties in purchase of goods or equipment, usually in the defense industry and when large sums are involved. In these contracts the seller may have different duties to the purchasing country, such as foreign investment, training, or purchase of nationally manufactured parts, among others.

Their use is not limited only to direct economic benefits. Many countries also use them as a means to access technology that otherwise would be difficult to obtain. To this extent, offset agreements are an important policy instrument for governments.

Their regulation is dependent on government policy and administrative law provisions of purchasing countries. In Brazil, offset agreements in the defense industry are regulated by Portaria n° 764, 2002, from the Ministry of Defense. This normative provision obliges the use of offset agreements in purchases of more than USD 5 million with the same purchaser in a twelve-month period, while maintaining this possibility in purchases lower than this amount.

Even though the regulatory instrument for offset agreements in Brazil was just developed in 2002, the offset practice has been in use in government contracts since the 1950s, when Brazilian aeronautics bought English planes and provided cotton in exchange. This is considered the first offset agreement made by the Brazilian government (Instituto de Fomento e Coordenação Industrial [IFI] website).

Other relevant offset agreements made within the aeronautics industry in Brazil were the purchase of F-5E airplanes in 1974, where the offset provided for the acquisition of important technology (e.g., vertical stabilizers and honeycomb bonding); and the purchase of 737 Boeings and A300 Airbuses, where the producers were required to install Brazilian-made seats. In 1992, Embraer benefited from the offset agreement established within the acquisition by Varig of three hundred McDonnell Douglas MD-11 airplanes. Through this offset agreement, Embraer signed a contract to manufacture the flaps of the airplanes. The agreement also provided for training and transfer of technology (IFI website).

Brazil currently has four offset agreements in the aeronautics sector: the F-5BR, VC-X, CL-X and P-3BR programs. The offsetting parties are ELBIT, Airbus, and, for the last



two programs, EADS-CASA. The F-5BR and the P-3BR are modernization programs, and the VC-X and CL-X are airplane purchase programs (the presidential airplane and light transport aircrafts, respectively) (IFI website).

### **Box 2. The National Investment Program for the Aeronautic Sector**

The National Investment Program for the Aeronautic Sector was created in 2008 within the context of the new national public policy (PDP—see Box 6), with the objective of informing, facilitating, and promoting national and international private investment in Brazil in the aeronautics sector, giving visibility to Brazilian opportunities and being a business facilitator.

In the first phase of the program (2008–2010), the actions of Apex-Brasil consisted of: (1) hiring KAFIC consultancy to identify companies that were interested in investing in Brazil; (2) visiting companies, organizations, and agents of the aeronautics sector in other countries (Canada, Portugal, France, and Sweden), with the result that foreign companies consulted Apex-Brasil and showed interest in investing in Brazil, such as Asco, Saab, Rolls-Royce, and the companies in the Évora cluster in Portugal; (3) attracting GE’s R&D Center, which envisions investments in technological areas of the aeronautics sector, to Brazil; (4) supporting the Offset Workshop KC-390 in the São José dos Campos Technological Park, where the investment facilitation services from Apex-Brasil were presented to foreign companies; (5) facilitating the construction of strategic alliances among Brazilian and foreign companies at the Farnborough International Airshow in 2010.

### **Box 3. The Embraer vs. Bombardier Dispute**

In 1996, just after Embraer presented its first regional jet—the EMB 145—Canada started a comprehensive diplomatic action in the WTO against Brazil in order to protect its national aircraft manufacturer, Bombardier. Canada challenged a Brazilian instrument for export financing, PROEX Equalization, which allegedly distorted interest rates. At the same time, Brazil also requested diplomatic consultations within the WTO to question three programs to

support Canadian exports: Canada Account, Technology Partnership Canada (TPC), and some funding from the Canadian Bank for export credits—Export Development Canada (EDC).

In 1998, WTO opened panels in its Dispute Settlement Body (OSB): one to question Brazilian PROEX and another for Canadian government's support program to Bombardier. As expected, both programs were considered illegal according to WTO rules. The Brazilian PROEX program was ruled illegal without it even being necessary to analyze the facts of the case because it was clearly disrespecting trade rules, while Canada Account and TPC measures were identified as prohibited export subsidies and ruled illegal as well. In the second round of panels opened by Canada, a revised PROEX was considered to be 100% in accordance with WTO rules. Then, in another panel, the WTO Dispute Settlement Body ruled that several Canadian financing export transactions were illegal, conferring to Brazil the right to apply trade restrictions against Canada (the cases are WT/DS46, WT/DS70, WT/DS71 and WT/DS222).

In a scenario where Brazil and Canada had retaliation rights and an almost inexistent trade flow regarding civil aircrafts, the enforcement of these rights would have had a negative impact in other productive chains and final consumers in both countries. Moreover, any retaliation of that nature wouldn't have had any impact on the effects that had already been generated by the subsidies regarding competition dynamics in the aviation market.

After the collapse of negotiations between the countries, the Organization for Economic Co-operation and Development (OECD) decided to revise its Aircraft Sector Understanding (ASU), and invited Brazil and Canada to participate in the process. Both countries signed the new understanding, which included multilateral disciplines relating to payment terms, interest rates, and risk-operation bonuses. The signatories committed themselves to abide by the agreement's conditions when offering support to national civil aircraft exporters. In short, the agreement helped to reduce competitive distortions arising from different capacities of each country to support its national industry, especially civil aircraft export financing programs.

The Brazilian aeronautics chain has benefited from ASU because it has leveled the field and guaranteed a fairer competition in terms of government funding.

#### **Box 4. The Pro-Aeronáutica Program**

One of the main results of this new policy for BNDES was the creation of a new program

called Pro-Aeronáutica. This program, using many of the bank's credit lines, tried to establish credit access conditions that were in accordance with the necessities and particularities of the companies in the aeronautics sector. Pro-Aeronáutica pursues long-term financing to support investments made by SMEs that are part of the Brazilian aeronautics supply chain, with the objective of densifying the chain.

The program is divided into two subprograms: one named Pro-Aeronáutica Empresa (company) and the other named Pro-Aeronáutica Exportação (export). Pro-Aeronáutica Empresa was created to finance the “implementation, extension, recovery, modernization and development of aeronautics products and services made under the risk-partnership model between SMEs established in Brazil and producers of airplanes located in Brazil or outside, as well as financing innovation projects and the technological development of these companies, related to risk-sharing partnerships or not” (BNDES website).

A clear objective, therefore, would be to allow, through long-term financing, the SMEs established in Brazil to become risk- partners of Embraer or any other foreign company, although the BNDES recognizes the actual limited capacity of the Brazilian SMEs to achieve this goal.

There are two modalities of the “*Pro-Aeronáutica Exportação*” program: The BNDES Exim Pre-shipment financing, which can be used by SMEs that are part of the Brazilian aeronautics supply chain in their pre-shipment production phase of goods and services that are destined to export; and the BNDES Exim Post-shipment financing, which provides support to the commercialization in foreign countries of goods and services produced by SMEs that are part of the Brazilian aeronautics supply chain, in the modality of refinancing, through the discount of credit titles or the assignment of credit rights related to the beneficiary's exports (BNDES website).

The program was created in 2007 with an authorized amount of R\$ 100 million and a three-year validity, which was extended in 2010 until 2013. However, the interviewed companies, like other actors in the sector, complained about the difficulty of access to the program, mainly regarding the guarantees that were demanded. In fact, the R\$ 100 million available haven't been officially used, even though many SMEs in the sector profited from other credit lines of BNDES not necessarily linked to the Pro-Aeronáutica program, such as in the case of Grauna, which confirmed the bank's effective policy toward the SMEs in the sector.

**Box 5. The Industrial, Technological, and Foreign Trade Policy (PITCE, Política Industrial, Tecnológica e de Comércio Exterior)**

The PITCE of the Brazilian federal government was a collaborative industrial policy initiative signed on by five ministries and four other federal government organs, including the following ministries: interior; development, industry, and trade; economics; planning; science and technology; in addition to IPEA, Brazilian Development Bank (BNDES), Financiadora de Estudos e Projectos (FINEP), and Brazilian Trade and Investment Promotion Agency (Apex-Brasil).

The main idea behind the PITCE was to organize and articulate a national system of innovation for Brazil, while remaining focused on the stated underlying economic policy priorities of improving citizen welfare and income distribution. The original policy directives were concerned with the macro-economy, calling particular attention to growth, public debt, external vulnerability, investment and savings rates, and the trade balance.

However, it also provided space for and gave welcome priority to developing the innovation and technological capabilities of firms and industrial sectors. It specifically aimed at increasing the efficiency of the productive structure; boosting the innovative capacity of Brazilian firms; expanding exports; and creating a virtuous circle of interaction among the relevant agents so as to increase the competitiveness of Brazilian industry. Although it supported SMEs, it believed that consistent innovation processes and insertion into global markets were best achieved by fostering the growth of dynamic, large nationally owned enterprises.

Since its announcement in 2003, the federal government took action in three policy areas under the auspices of the PITCE: (1) horizontal actions to increase industrial competitiveness—industrial modernization, innovation and technological development, expansion of external trade, and improved institutional environment; (2) strategic options for overall competitiveness—software, semi-conductors, capital goods, and pharmaceuticals; and (3) future-oriented technologies—biotechnology, nanotechnology, and renewable energy. The horizontal actions under PITCE directives fell into a variety of categories, mainly requiring

new legislation, regulatory changes, financial provision, and improved institutional performance.

### **Box 6. The Productive Development Policy (PDP, Política de Desenvolvimento Produtivo)**

The PDP was launched in May 2008 to succeed the PITCE, encompassing a broader and more complex range regarding the articulation of public and private agents.

Drafted under the coordination of the Ministry of Development, Industry, and Foreign Trade (MDIC, Ministério do Desenvolvimento, Indústria e Comércio Exterior), in partnership with the Treasury and the Science and Technology Ministries and institutions such as the BNDES, the PDP presents four macro goals that have the objective of accelerating fixed investment, stimulating innovation, amplifying the Brazilian international insertion, and increasing the number of exporting SMEs.

To implement the new policy, a number of sectors were chosen: health; information and communication technology; nuclear energy; defense industry; nanotechnology; biotechnology; automotive industry; capital assets; textile sector; wood and furniture; hygiene; cosmetic sector; civil construction; services industry; naval industry; leather; shoes; agroindustry; biodiesel; plastics; aeronautics industry; oil and gas; bioethanol; mining; siderurgy; cellulose; and beef.

As mentioned, the aeronautics sector was one of the sectors in the industrial policy that led to a specific policy: the PDP—Aeronautics Industry.

The PDP—Aeronautics Industry encompasses the challenges, goals, instruments, and actions for the strengthening of Brazilian companies in the international environment, measured through the participation of these companies in Brazilian exports and also through their participation in the global market in their specific area of production. The Brazilian Industrial Development Agency (Agência Brasileira de Desenvolvimento Industrial—ABDI) is part of the Executive Secretariat of the PDP, together with the Treasury Ministry and the BNDES, and it had a great influence in this project.

The four goals for 2010, defined in the original PDP—Aeronautics Industry, were: (1)

maintain the third position in the global market of commercial airplanes; (2) amplify the participation in the global market of executive airplanes; (3) increase helicopter export to South America; and (4) increase the productivity of companies that produce aero parts.

The Aeronautics PDP was reviewed in 2009, a process in which thirty strategic measures between public and private agents were designed, divided into five actions: (1) densification of the supply chain; (2) modernization of the tax and customs procedures; (3) strengthening the R, D & I base; (4) expansion of participation in the internal and external markets; and (5) professional qualification.

**1. Action: Densification of the supply chain**

1. **Measure:** adequate financing for the sector, especially for SMEs  
**Responsibility:** BNDES
2. **Measure:** incentivize the installation of raw material suppliers in the country  
**Responsibility:** MDIC, BNDES, Apex-Brasil, sectorial entities
3. **Measure:** promote the attraction of new investments  
**Responsibility:** MDIC, Apex-Brasil, BNDES
4. **Measure:** encourage international companies' associations with local suppliers  
**Responsibility:** BNDES
5. **Measure:** develop new local suppliers  
**Responsibility:** MDIC
6. **Measure:** promote the participation of public and private investment funds in the aerospace segment  
**Responsibility:** BNDES, MCT, FINEP

**2. Action: Modernization of the tax and customs procedures**

1. **Measure:** promote a tax treatment that is adequate to the set of supply chains  
**Responsibility:** MDIC, MF, sectorial entities
2. **Measure:** set a working group to update the work regarding fiscal incentives  
**Responsibility:** MDIC, MF, sectorial entities
3. **Measure:** match the tax regime according to the international competitors  
**Responsibility:** MF, MDIC, CAMEX
4. **Measure:** give efficiency to the customs regulation to facilitate the insertion of companies of the sector in GVCs

|           |   |
|-----------|---|
|           | <p><b>Responsibility:</b> MDIC, CAMEX, MF, MRE, ANAC, sectorial entities</p> <p>5. <b>Measure:</b> rationalize the control and verification procedures over fiscalization<br/><b>Responsibility:</b> MF</p> <p>6. <b>Measure:</b> modify relevant legislation<br/><b>Responsibility:</b> MF</p> <p>7. <b>Measure:</b> rationalize the control and verification procedures over customs fiscalization<br/><b>Responsibility:</b> MDIC</p> <p>8. <b>Measure:</b> study the tax treatment over operations made with machines<br/><b>Responsibility:</b> MF</p> <p>9. <b>Measure:</b> review the storage fees in airports<br/><b>Responsibility:</b> ANAC</p>   |
| <b>3.</b> | <p><b>Action: Strengthening the R, D &amp; I base</b></p> <p>1. <b>Measure:</b> structure the Sibratec-Aeronautic network<br/><b>Responsibility:</b> MCT, FINEP</p> <p>2. <b>Measure:</b> promote intellectual property protection in the aeronautics sector<br/><b>Responsibility:</b> MCT, FINEP</p> <p>3. <b>Measure:</b> create laboratories specialized in strategic activities to the sector<br/><b>Responsibility:</b> MDIC, INPI</p> <p>4. <b>Measure:</b> disseminate the existing instruments to expand R, D &amp; I<br/><b>Responsibility:</b> MCT, FINEP, BNDES, APESP, IPT EMBRAER</p> <p>5. <b>Measure:</b> attract activities and centers in R, D &amp; I of MNCs to Brazil<br/><b>Responsibility:</b> MCT, FINEP</p> <p>6. <b>Measure:</b> use the purchasing power of the government<br/><b>Responsibility:</b> MDIC, ABDI</p> <p>7. <b>Measure:</b> increase the resources for R, D &amp; I<br/><b>Responsibility:</b> MCT, FINEP</p> |
| <b>4.</b> | <p><b>Action: Expansion of participation in the internal and external markets</b></p> <p>1. <b>Measure:</b> promote the homologation and national certification in aeronautics quality management<br/><b>Responsibility:</b> ANAC, MDIC, ABDI, SEBRAE, BNDES, sectorial entities</p>  |

2. **Measure:** support the insertion of Brazilian products in the foreign market  
**Responsibility:** MF, MDIC, BNDES, Apex-Brasil, sectorial entities
3. **Measure:** support the inclusion of the industry in bilateral or multilateral agreements  
**Responsibility:** ANAC
4. **Measure:** support small national plane manufacturers, strengthening the chain  
**Responsibility:** BNDES
5. **Measure:** study the mechanisms of credit guarantee for internal sales  
**Responsibility:** MF

**5. Action: Professional qualification**

1. **Measure:** foster the formation of a specialized technical work force  
**Responsibility:** MF, MCT, FINEP, MDIC, ABDI
2. **Measure:** develop and professionalize SME management  
**Responsibility:** MDIC, ABDI, Apex-Brasil, SEBRAE

From the actions and measures adopted or renewed due to the PDP, some deserve to be underlined because of their consequences on the supply chain; such as the renewal of the already-mentioned BNDES Pro-Aeronáutica program; the creation of the National Investment Program for the Aeronautics Sector by Apex-Brasil; the formation of the Agreement of Apex-Brasil and CECOMPI; and the creation of the Special Regime of Tax Incentives to the Aeronautic Industry (Retaero) in 2009.

### **Box 7. The CONTEC Program**

Created in 1991 by the BNDESPAR as an experimental program, CONTEC was aimed at the integration of venture capital in the development process of Brazilian technology SMEs). It started its activities with four companies in which BNDESPAR had invested before, and by 1994 eleven more companies had already been included in the program, representing a total approved amount of USD 24.5 million to be invested (Castello Branco, 1994).



Within this program, BNDESPAR could participate with up to 40% in equity in the company, having the investment amount capped at USD 2 million in the first round of investment and up to a total of USD 6 million in the following rounds. The reason behind the 40% limit was the fact that the program's focus was not on taking over the management of the company, but only in helping the managers (the SMEs' entrepreneurs) to develop it (Gorgulho Pinto, 1997).

Legally, BNDESPAR could sit on the board of directors of an invested company, but this right was usually not exercised in order to avoid influencing the decision-making process of the company. Monitoring and control was done through the analysis of the company's financial statements and discussions with the members of the company (Gorgulho Pinto, 1997).

The program was consolidated and transformed into an operation that today has its own department inside the bank, known as the Entrepreneur Capital Area, which as of 2010 is responsible for overseeing thirty-five companies (Shapiro, 2010).

### **Box 8. Consortium and Joint Venture**

The Brazilian corporation law (Lei 6.404/76) defines consortium (art. 278, caput) as the partnership between corporations or other forms of legal societies with the purpose of carrying out a specific project that provides goods or services. According to the law, this kind of association does not create a legal personality (art. 278, § 1º). For this reason, the consortium should be established by contract and it does not have a social capital or liquid patrimony. In this case, the capital account is replaced by a bank account of one of the members of the consortium (Resolução do CFC nº1.053/2005).

The consortium's members are required to appoint one of them to be the leader ("Empresa Líder") that will represent and manage the consortium. Each member has the number of votes established by the contract. In terms of liability, members are liable for their obligations inside the consortium. However, members can agree and set unlimited liability as the rule.

Brazilian scholars are unanimous in affirming that consortia in Brazil have always suffered from a lack of appropriate legal support. In this sense, despite the fact that Brazilian

law has no specific provisions about consortium with legal personality, Apex-Brasil encouraged the SMEs to create a partnership with an association legal form.

In 2006, the Brazilian Congress passed a general law for SMEs (LC 123/2006), which, in art. 56, created “consórcio simples.” It was directed to SMEs that adopted the Simples Nacional tax regime,<sup>58</sup> and aimed to increase competitiveness and their entry into new domestic and foreign markets through economies of scale, reduction costs, strategic management, more training, access to credit, and new technologies. However, “consórcio simples” still were considered poorly regulated, which resulted in a high level of uncertainty.

For this reason, in 2008, Lei Complementar 128/08 introduced the SPE (Sociedade de Propósito Específico) specifically for the SMEs under the “simples” tax regime. SPEs can be created by corporation or LLC and must be created with a specific purpose. One of the advantages of SPEs is that it confers legal personality to this form of partnership. It also has its own accounting records and, unlike consortia, may acquire assets.

### **Box 9. Association**

The Civil Code defines “associations” as the union of persons that are organized for nonprofit purposes. Associations are regulated mainly by the Brazilian Federal Constitution in art. 5º, XVII-XXI, art.174, § 2º, and by the Civil Code in art. 53 to art. 61. Brazilian law confers this form of association legal personality so that it can represent and defend its members’ interests, and promote their improvement in technical, professional, and social fields set by the association. If properly authorized by its members, associations can even defend them judicially.

Its assets consist of fees paid by its members, funds, donations, and own reserves; it does not have social capital. This can be an obstacle to associations that are interested in obtaining credit from financial institutions. In case the association is terminated, any remaining assets in excess of what was contributed by each member have to be destined to another not-for-profit entity, and in case none is chosen, either by the charter or the deliberation of the members, to some governmental institution with similar purposes.

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<sup>58</sup> The tributary regime “Simples Nacional” can be adopted only by SMEs that have gross revenues equal or less than R\$ 240,000.00/year (micro) and equal or less than R\$ 2,400,000.00/year (small).

As for its governance, each member of the association has one vote in a general meeting and the association's decisions are made with the participation of its members (if not provided otherwise in the charter). Furthermore, an association cannot have profit purposes as its main goal. However, it can perform commercial activities as long as the objective is to implement its nonprofit goals. Profits must be used solely to accomplish the association's activities. In this sense, it can realize bank and financial operations and receive public funding as well. Finally, the associates are not directly liable for the association's obligations.

**Table 1. Ranking of Commercial Aircraft Manufacturers**

| <b>COMMERCIAL AIRCRAFT</b> |                         |                              |                         |                         |  |
|----------------------------|-------------------------|------------------------------|-------------------------|-------------------------|--|
| <b>Sector Rank 2010</b>    | <b>Sector Rank 2009</b> | <b>Company</b>               | <b>Sales 2010 (\$m)</b> | <b>Sales 2009 (\$m)</b> |  |
| 1                          | 1                       | Airbus Commercial (excl ATR) | 36,659                  | 36,668                  |  |
| 2                          | 2                       | Boeing                       | 31,834                  | 34,051                  |  |
| 3                          | 3                       | Bombardier                   | 8,614                   | 9,357                   |  |
| 4                          | 4                       | Gulfstream                   | 5,299                   | 5,171                   |  |
| 5                          | 5                       | Dassault Aviation            | 4,276                   | 3,393                   |  |
| 6                          | 6                       | Embraer                      | 2,889                   | 3,382                   |  |
| 7                          | 8                       | Hawker Beechcraft            | 2,805                   | 3,199                   |  |
| 8                          | 7                       | Cessna                       | 2,563                   | 3,320                   |  |
| 9                          | 9                       | ATR                          | 1,350                   | 1,400                   |  |
| <b>TOTAL</b>               |                         |                              | <b>96,289</b>           | <b>99,940</b>           |  |

Source: PricewaterhouseCoopers in Thisdell (2011).

**Table 2. Ranking of Civil and Military Engine Manufacturers**

| <b>ENGINES (CIVIL AND MILITARY)</b> |                         |                     |                                      |                         |                         |
|-------------------------------------|-------------------------|---------------------|--------------------------------------|-------------------------|-------------------------|
| <b>Sector Rank 2010</b>             | <b>Sector Rank 2009</b> | <b>Company</b>      | <b>Division</b>                      | <b>Sales 2010 (\$m)</b> | <b>Sales 2009 (\$m)</b> |
| 1                                   | 1                       | General Electric    | Aircraft Engines (excl. Smiths est.) | 15,680                  | 15,615                  |
| 2                                   | 2                       | United Technologies | Engines (Pratt & Whitney)            | 12,935                  | 12,392                  |
| 3                                   | 3                       | Rolls-Royce         | Civil Aerospace and Defence          | 10,875                  | 10,124                  |
| 4                                   | 4                       | Safran              | Propulsion (Air & Space)             | 7,424                   | 7,888                   |
| 5                                   | 5                       | Honeywell*          | Aerospace (estimates)                | 5,287                   | 5,065                   |
| 6                                   | 6                       | MTU                 |                                      | 3,586                   | 3,630                   |
| 7                                   | 7                       | IHI                 | Aero-Engines & Space Operations      | 3,064                   | 2,957                   |
| 8                                   | 8                       | Avio                | Aeroengines and Avioservice          | 1,943                   | 1,963                   |
| 9                                   | 9                       | Volvo               | Aero                                 | 1,069                   | 1,020                   |
| 10                                  | 10                      | ITP                 |                                      | 640                     | 666                     |
| <b>TOTAL</b>                        |                         |                     |                                      | <b>62,504</b>           | <b>61,321</b>           |

Source: PricewaterhouseCoopers in Thisdell (2011).

**Table 3. Embraer Production Chain: Risk Partners, Suppliers, and Subcontractors**

|                        | <b>Risk Partners</b>   | <b>Suppliers</b>  | <b>Subcontractors</b>   |
|------------------------|--|---|---|
| <b>Participation</b>   | Co-development with Embraer; share the financial risk of the project                 | Apply Embraer's specifications  | Embraer provides raw material and specifications; services charged on employee/hour basis |
| <b>ERJ-145 Family</b>  | 4 (structure and interiors)  | 250 (avionics, electronics, raw material, mechanics-hydraulics)                         | Engineering projects/systems; machining and chemical treatment                            |
| <b>ERJ-170/190</b>     | 16 (avionics, electronics, propulsion, mechanics-hydraulics, structure, interiors)   | 22 international suppliers  | <i>Idem</i>   |
| <b>Nationality</b>     | Mostly international   | Mostly international  | Brazil  |
| <b>Purchase Policy</b> | Exclusivity contract; amortized investment with aircraft sales (payment in 110 days) | Exclusivity contract (payment in 75 days); 1to-3-year contracts (payment in 30-90 days) | 1-to-2-year contracts (payment in 30 days); service orders                                |

*Source: Embraer apud Lima et al. (2005).*

**Table 4. Limited Liability Company vs. Corporation**

|                       |                          | <b>LIMITED LIABILITY COMPANY</b>                            | <b>CORPORATION</b>  |
|-----------------------|--------------------------|---|---|
| <b>Applicable Law</b> |                          | Civil Code Law n. 10.406/2002 (arts. 1.052 to 1087 CC).     | Corporation Law n. 6.404/76 (or "Lei das S.A.") with amendments                         |
| <b>Equity</b>         | <b>Capital Structure</b> | - Equity is divided in membership quotas, equal or unequal. | - Equity is divided in shares, with the possibility of ordinary and preferential shares |

|  |  |   |   |
|--|--|---|---|
|  |  | <ul style="list-style-type: none"> <li>- Membership quotas can have different political rights.</li> <li>- Voting rights are inseparable from property rights.</li> <li>- The use of preferential membership quotas (without voting rights) is questionable (it is prohibited according to the DNRC—Instruction 98/03).</li> </ul>  | <p>(without voting rights).</p> <ul style="list-style-type: none"> <li>- There may be ordinary and preferential shares with distinct political and patrimonial rights (arts. 16 and 18 of “Lei das S.A.”).</li> <li>- The use of <i>golden shares</i> in state companies is questionable (shares with veto rights) (art. 17, § 7º “Lei das S.A.”).</li> </ul>   |
|  | <b>Fund-Raising</b>                      | - Public funding using securities is impossible.  | - Corporations can issue securities.  |
|  | <b>Internal Organizational Structure</b> | <p>Corporate Governance:</p> <ol style="list-style-type: none"> <li>1. Members’ Meeting (mandatory with more than ten members—art. 1072, § 1º CC);</li> <li>2. Single administration (directorship is mandatory— one or more directors designated in the articles of organization or in a separate act—art. 1060 Civil Code) or dual (Administration Council) is possible—supplementary rule of the “Lei das S.A.,” non mandatory, with competence in matters that are not restricted to the Members’ Meeting or the Directors;</li> <li>3. Fiscal Council is allowed.</li> </ol> | <p>Corporate Governance:</p> <ol style="list-style-type: none"> <li>1. Shareholders’ Meeting;</li> <li>2. Single administration (directorship is mandatory— two or more directors— shareholders or not) or dual (Administration Council composed of three members—art. 140 Lei S.A.— shareholders art. 146 Lei S.A);</li> <li>3. Fiscal Council (its existence is mandatory, but its functioning is optional).</li> </ol> |
|  | <b>Administrative Structure</b>          | <ul style="list-style-type: none"> <li>- The persons in charge of administration must be assigned in the Articles of Organization or in a separate act.</li> <li>- Administrator can be a member or not, if the articles of organization allow. In the case of a non-member administrator, all the</li> </ul>   | <ul style="list-style-type: none"> <li>- It can be constituted only by the Directorship (minimum of two members that must reside in the country) or Directorship and Administration Council (minimum of three members).</li> <li>- In public companies, companies with authorized capital, and companies with</li> </ul>  |

|                    |   |   |
|--------------------|---|---|
|                    | <p>members have to approve if the quotas are not fully paid, and in the case they are, 2/3 of the members must approve.</p> <p>-The Articles of Organization must define the administrative structure; in other words, if there is an Administration Council and Directorship or just the Directorship.</p> | <p>government capital, the Administration Council is mandatory.</p> <p>- The Articles of Incorporation must define if the Administration Council exists, the number of members, the mode of choice, the mode of substitution, term of office, etc. (art. 140, I to IV, Lei das S.A.)</p> <p>- The Articles of Incorporation must define the maximum and minimum number of directors, the mode of substitution, term of office, power of directors, etc (art. 143 "Lei das S.A.").</p> |
| <b>Supervision</b> | Fiscal Counsel, if provided in the Articles of Organization.  | Fiscal Counsel, permanent or created for the fiscal exercise (mandatory existence, optional functioning).   |

Source: Prado and Prado (2006).

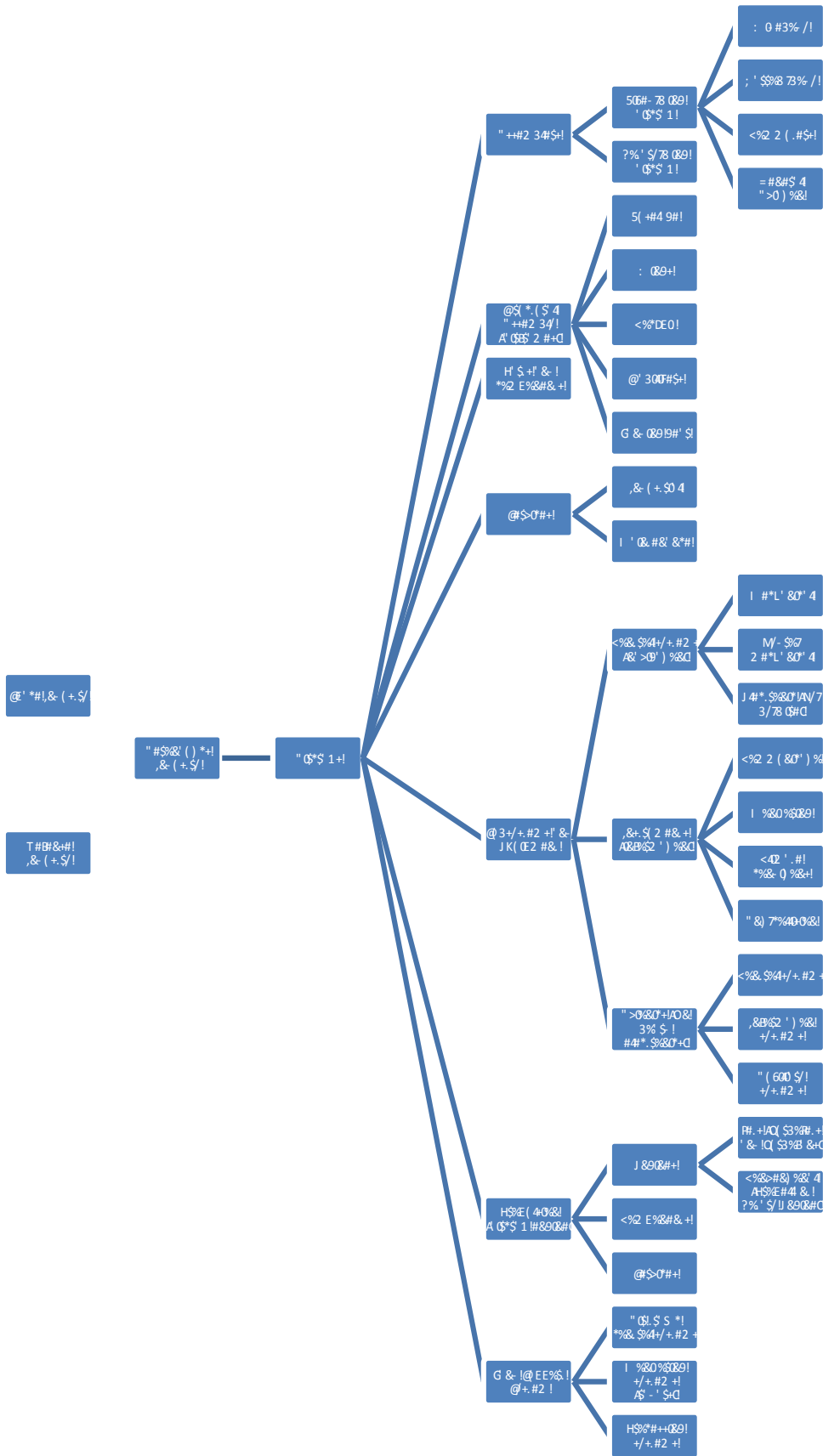
**Table 5. HTA Members**

| <b>HTA Original Founding Members</b>       |
|--|
| Grauna Usinagem Ltda.                      |
| Bronzeana Usinagem Ltda.                   |
| SPU Indústria de Peças Ltda.               |
| Automata Industrial                        |
| Compoende Beneficiamento de Peças Ltda.    |
| Aeroserv—Serviços Aeronáuticos             |
| AKAER                                      |
| Mirage—Indústria e comércio de peças Ltda. |

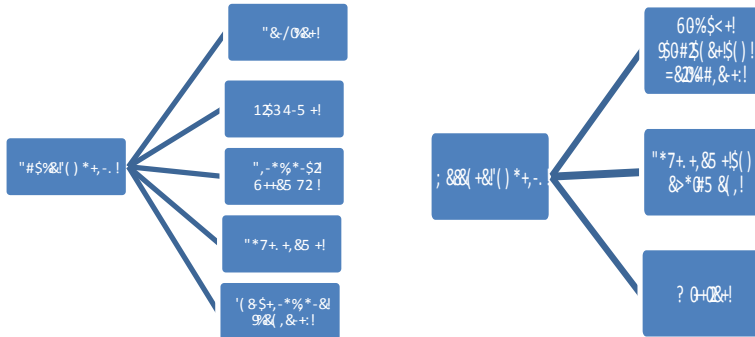
| <b>HTA Members in 2012</b>                                   |
|--|
| Grauna Aerospace S.A.  |
| Thyssenkrupp Automata Indústria de Peças Ltda.               |
| Compoende Beneficiamento de Peças Ltda.                      |
| Alltec Indústria de Componentes em Materiais Compostos Ltda. |
| Panmetal Indústria Metalúrgica Ltda.                         |
| Toyo Matic Aerospace Ltda.                                   |
| Villares Metals S.A.   |
| Lanmar Indústria Metalúrgica Ltda.                           |
| Massucato Indústria e Comércio Ltda.                         |
| Indústria Mecânica Marcatto Ltda.                            |
| A.S. Avionics Services Ltda.                                 |
| Bodycote Brasimet Processamento Térmico S.A.                 |
| Fastwork Programs Systems Ltda.                              |
| GMP Marcatto-Indústria e Comércio de Peças Ltda.             |
| Solutions Design & Engineering                               |
| Usinagem e Ferramentaria Tonini Ltda.                        |
| Giovanni Passarella & Cia. Ltda.                             |

*Source: HTA website*

**Figure 1. Aeronautics Sector by Industrial Segment**



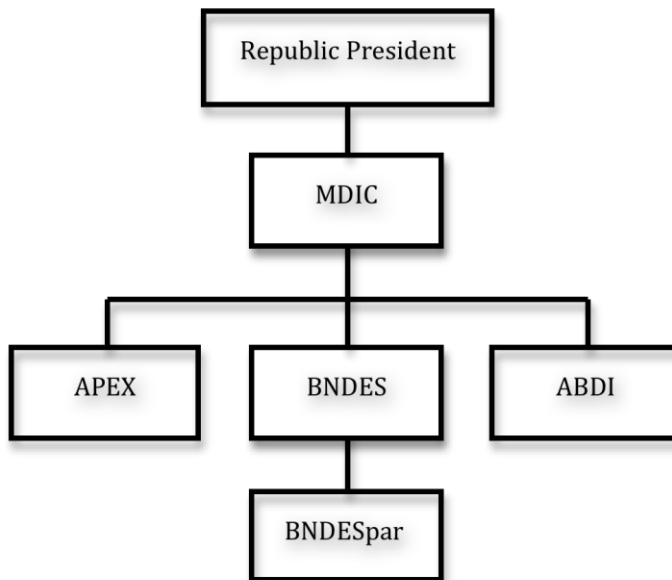




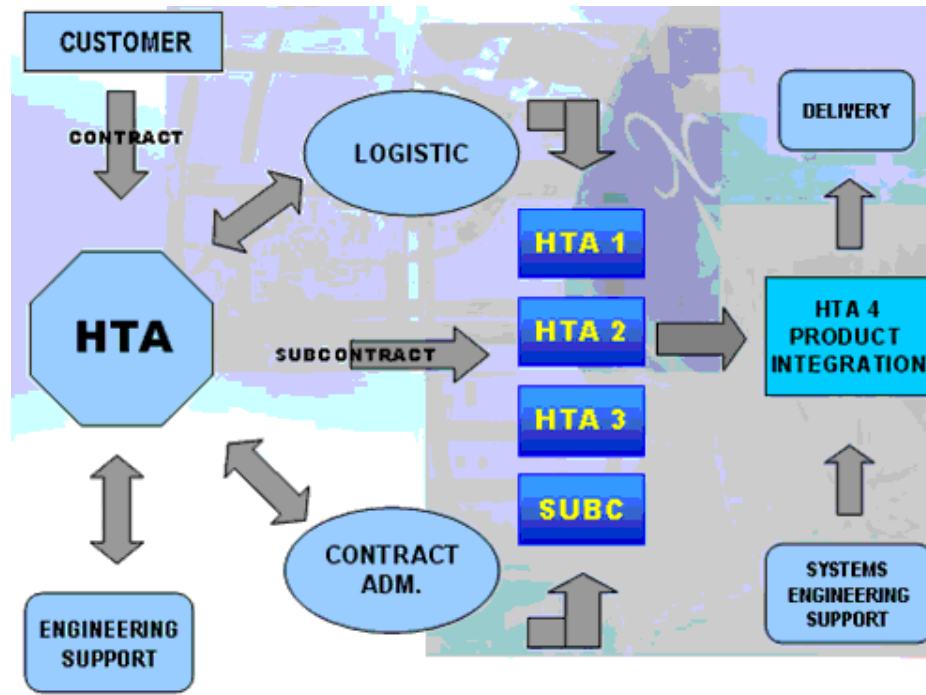
Source: data from Luz (2010).

**Figure 4. MDIC Institutional Organization**

**FEDERAL GOVERNMENT – MDIC ORGANIZATION**



**Figure 5. HTA Contractual Chain**



*Source: HTA apud Quintanilha and Almeida, (2008).*

## 2. COFFEE SECTOR

### Box 10. Minas Gerais State Programs for the Promotion of Differentiated Coffee

Due to CACCER mobilization, the Minas Gerais state government established, in 1996, through Decree No. 38.559, a program of Indication of Origin certification for the coffee growing regions of the state, which was called Certificafé.

The objective of Certificafé is, taking into account the importance of coffee for the Minas Gerais state economy, to facilitate the characterization of the coffee produced in each of the ecological regions of the state, and to highlight and enhance the quality of the product of each of these regions. The Instituto Mineiro de Agropecuária (IMA) was appointed responsible for the identification, classification, and definition of each area of coffee production in Minas Gerais state and has delineated four coffee growing regions, namely: South of Minas, the Cerrado region of Minas, the Mountain region of Minas, and the Chapada

region of Minas.

The IMA was also indicated responsible for developing standards for the issuance and cancellation of the Coffee Certification of Origin, and standards for professional associations or cooperatives of the rural segment accreditation to issue the Coffee Certification of Origin (Decree No. 38.559, Article 12, III and IV).

The CACCER was accredited in 1998, by IMA, as an origin-certifying entity of the coffee produced in the Cerrado region.<sup>59</sup> The creation of a certification system for indication of origin was part of CACCER's goals to link the coffee quality characteristics to the geographical features of the place of production, a strategy that creates specific market niches with higher barriers to entry for competitors of high-quality coffee production.

It is important to mention that some criticisms were raised to the Coffee Certification of Origin program created by the Minas Gerais state government. Normally, the differentiation by indication of origin is based on the definition of small farms or small producing regions with very specific production patterns and physical and geographic characteristics. The regions demarcated by the Certificafé program are very extensive and one may find very different climatic conditions and soil characteristics in the same demarcated region, making it difficult to establish the relationship between product quality and origin of production. Besides the natural conditions heterogeneity, there are also, in each region, different structures of coffee production, making it difficult to homogenize the production conditions for the purposes of product identification by origin (Grandjean, 2003).

Another important initiative of Minas Gerais state is a program for the dissemination of coffee-producing property certification for the maintenance of good agricultural practices (according to environmental and social sustainability and food safety criteria): the Certifica Minas.

The program is run by IMA and Emater—MG, both within the Minas Gerais state Department of Agriculture, Livestock, and Supply. One of the program's objectives is to increase the share of Minas Gerais state agricultural production in the national and international markets, since the project contributes to the overcoming of the existing zoophytosanitarian barriers, thanks to the monitoring of the quality of the agricultural production processes (Programa Certifica Minas Café website).

The program is articulated as follows: Emater visits the producing properties selected to take part in the program, instructing the producer in relation to the necessary adjustments in

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<sup>59</sup> <http://www.expocaccer.com.br/cafecerrado.html>

his property. IMA performs the preliminary audits to check the adjustments were made in accordance with international standards. An internationally recognized certifying entity completes the process, performing a final audit and certifying the approved properties.

The cost of technical assistance, audits, and certification itself are supported by Minas Gerais state. The producer has to bear only the cost of adapting the property in accordance with the standards required.

One of the main results of the program is the dissemination of best practices in production processes management and environmental and social sustainability. The program addresses one of the challenges of small and medium coffee producers, which is the high costs associated with technical assistance and the certification process itself.

BSCA recognizes the certification provided by the Certifica Minas program for the purpose of meeting one of the association's membership requirements. Certifica Minas then opens for the coffee farmers the opportunity to think about promoting the quality certification of their coffee production by BSCA methodology, creating good chances of integration in more stringent production chains in terms of quality.

**Table 6. Total Coffee Production of Exporting Countries, November 2009–October 2010**

| Country     | (000—<br>60kg bags) | % of 2010 world<br>production<br>(approx.) |
|-------------|---------------------|--|
| Brazil      | 48,095              | 35.9%                                      |
| Vietnam     | 18,500              | 13.8%                                      |
| Colombia    | 9,200               | 6.8%                                       |
| Indonesia   | 9,169               | 6.8%                                       |
| Ethiopia    | 7,450               | 5.5%                                       |
| India       | 4,983               | 3.7%                                       |
| Honduras    | 4,290               | 3.2%                                       |
| Mexico      | 4,100               | 3%   |
| Guatemala   | 3,950               | 2.9%                                       |
| Ivory Coast | 2,200               | 1.6%                                       |

|                        |         |      |
|------------------------|---------|------|
| Others                 | ...     | ...  |
| Total world production | 133,631 | 100% |

Source: Data from ICO website (<http://www.ico.org/prices/po.htm>).

**Table 7. Total Coffee Exports by Exporting Countries to All Destinations, November 2009–October 2010**

| Country                | 000—<br>60kg bags<br>(approx.) | % of 2010 world<br>production<br>(approx.) |
|------------------------|--------------------------------|--|
| Brazil                 | 31,569                         | 33.3%                                      |
| Vietnam                | 14,500                         | 15.3%                                      |
| Colombia               | 7,293                          | 7.7%                                       |
| Indonesia              | 5,894                          | 6.2%                                       |
| India                  | 4,406                          | 4.6%                                       |
| Ethiopia               | 3,429                          | 3.6%                                       |
| Honduras               | 3,159                          | 3.3%                                       |
| Mexico                 | 2,525                          | 3%   |
| Guatemala              | 3,429                          | 2.6%                                       |
| Ivory Coast            | 1,960                          | 2%   |
| Others                 | ...                            | ...  |
| Total world production | 94,550                         | 100%                                       |

Source: Data from ICO website (<http://www.ico.org/prices/ml.htm>).

**Table 8. Total Coffee Imports by Selected Importing Countries from All Sources, September 2009–October 2010**

|                       | 000 -<br>60kg bags | % of the world<br>import<br>(approximately) |
|-----------------------|--------------------|---|
| United States         | 23,013             | 22.3%                                       |
| Germany               | 20,538             | 19.9%                                       |
| Italy                 | 8,076              | 7.8%  |
| France                | 6,937              | 6.7%  |
| Japan                 | 6,871              | 6.6%  |
| Belgium               | 6,137              | 5.9%  |
| Others                | ...                | ...   |
| Total world<br>import | 103,150            | 100%  |

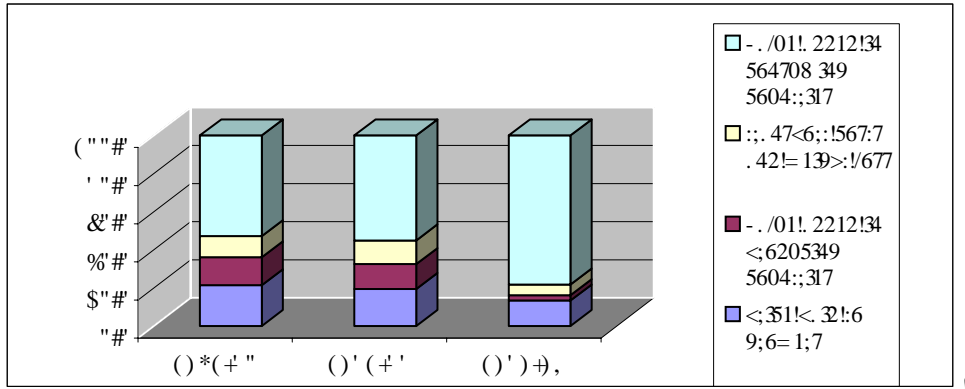
Source: Data from ICO website (<http://www.ico.org/prices/m4.htm>).

**Table 9: Per Capita Consumption (in Kilograms) in Selected Exporting and Importing Countries, 2009**

|             | Per capita consumption in Kg. |
|-------------|-------------------------------|
| Finland     | 11.98                         |
| Norway      | 9.00                          |
| Denmark     | 7.90                          |
| Switzerland | 7.68                          |
| Sweden      | 7.38                          |
| Germany     | 6.49                          |

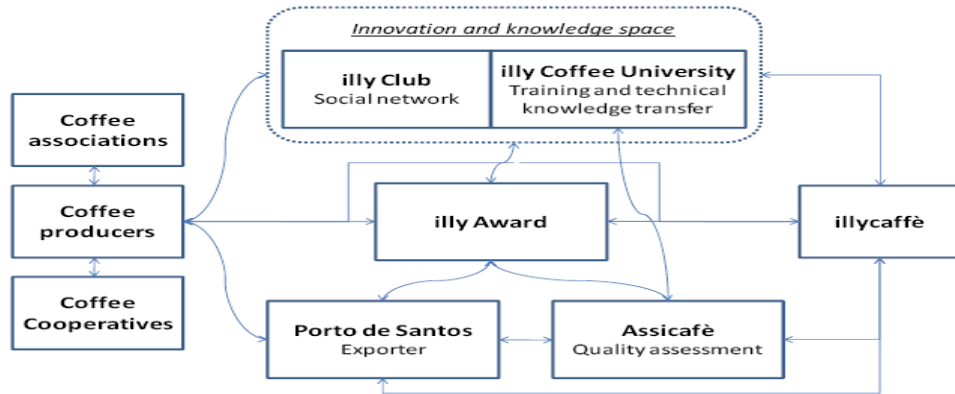
Source: Data from ICO website (<http://dev.ico.org/documents/cmr-0510-p.pdf>).

**Figure 8. Distribution of Coffee Income along the Coffee Chain (1971–1995) (%)**



Source: Talbot apud Ponte (2001).

Figure 9. Illy’s Transaction Platform in Brazil



Source: Ponte (2004).

### **3. LIST OF INTERVIEWS**

#### **I. Aeronautics Sector**

1. Grauna Aerospace S.A.
2. HTA (High Technology Aeronautics)
3. ALLTEC Indústria de Componentes em Materiais Compostos Ltda
4. BNDES (National Bank of Economic and Social Development)
5. ABDI (Brazilian Industrial Development Agency)
6. MDIC (Ministry of Development, Industry, and Foreign Trade)
7. Apex-Brasil (Brazilian Trade and Investment Promotion Agency)

#### **II. Coffee Sector**

1. Datterra Atividades Rurais Ltda
2. Illycaffè (Italy)
3. Universidade do Café Brasil—Unilly
4. ADS – Assessoria de Comunicações
5. Assicafé – Assessoria e Consultoria Agrícola
6. Porto de Santos Comércio, Exportação e Importação Ltda
7. Escritório Carvalhaes
8. BSCA (Brazilian Specialty Coffee Association)
9. Collective Interview (Apex-Brasil; BSCA; ASNC coffee exporter; Fazenda Ambiental Fortaleza; Fazenda Santa Margarida, Minas Sul Coffee Producers Cooperative)
10. Coffee producer Angelo Favoreto – Illy’s ex-supplier
12. Professor Silva Saes (Economy professor of the University of São Paulo – author of several studies in the coffee sector)