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Networks and Entrepreneurship: The
Modernization of Textile Production and
Distribution in Porfirian Mexico

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Abstract

As in other parts of the world, in Mexico, the coming of modern transportation and communications and technological changes in manufacturing machinery brought about during the late 19th century major changes in the production and distribution of goods and in firm's strategies and structure of the firms. This paper explores how this transformation took place in the Mexican textile sector between 1880 and 1910. It shows that it stemmed from the entrepreneurship of a dozen or so, French immigrants from Barcelonnette within a large and tight ethnic network, which construction was an important part of their entrepreneurial strategy for success.

Resumen

Como en otras partes del mundo, en México, la llegada de medios de transporte y comunicación modernos y los cambios tecnológicos en la maquinaria para manufactura trajeron durante finales del siglo XIX cambios significativos en la producción y distribución de bienes así como en las estrategias y estructura de las empresas. Este trabajo explora cómo dicha transformación sucedió en el sector textil mexicano entre 1880 y 1910. Se muestra que surgió del espíritu emprendedor de una docena de inmigrantes franceses de Barcelonnette con una red étnica amplia y estrecha, cuya construcción fue parte importante de su estrategia emprendedora para el éxito.

Introduction

In the United States, according to Chandler, the combined impact of technology and market growth led to the rise of the managerial business enterprise during the late 19th century. Ownership and management separated, and enterprises came to be operated by teams of salaried managers who had little or no equity in them. These firms came to enjoy spectacular competitive advantage, especially in the capital –and technology– intensive sectors in the United States, where throughput efficiencies and economies of speed, standardization, and mass markets could be achieved.¹

According to Chandler, textiles, as a labor-intensive industry, represented one of the sectors where we would expect the least institutional transformation because the large integrated firm had few competitive advantages.² However, the emergence of large-scale manufacture in the New England textile industry, carried out by limited liability corporations, has been considered part of the same process, generating major advances in productivity that gave an important competitive advantage to the United States relative to countries such as Great Britain.³

The assumption of the superiority of the American large-scale corporate model has been questioned by recent literature showing that different types of firms and strategies adapted better to their environments and could compete successfully with the larger corporate firms. This was the case with the Philadelphia textile industry studied by Scranton.⁴ Similarly, Mary B. Rose argues that British industry adapted better to the institutional, social, political, and cultural forces of that country without adopting a large-scale corporate form.⁵

Langlois and Robertson maintain that, since the late 19th century, the large and centralized corporate enterprise was not the only route to innovation and economic growth. Whether loose networks of small firms, coalitions, or joint ventures were preferred and formed the basis of competitive advantage depended upon “the nature of the problem... the stage in the product life cycle and the availability of information.”⁶ The nature of the problem was largely shaped, as well, by a firm’s institutional environment, that is, the formal and informal rules that affect the evolution of organizations, whether economic or political, and influence expectations

¹ Alfred D. Chandler Jr., *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge Mass., 1990): 235-94.

² *Ibid.*, 332-34.

³ William Lazonick, *Competitive Advantage on the Shopfloor* (Cambridge Mass., 1990).

⁴ Phillip Scranton, *Proprietary Capitalism: The Textile Manufacture at Philadelphia 1800-1885* (Cambridge, 1983).

⁵ Mary B. Rose, *Firms, Networks and Business Values* (Cambridge, 2000).

⁶ Richard N. Langlois and Paul L. Robertson, *Firms, Markets and Economic Change: A Dynamic Theory of Business Institutions* (London, 1995): 150.

and human responses.⁷ The institutional environment crucially affects the transaction and information costs that firms face and thus their strategies and structures.⁸

The institutional theory of the firm maintains that where regular transactions are conducted in a hazardous environment, bureaucratic arrangements, by reducing uncertainty, will increase efficiency.⁹ However, as Granovetter has explained, market and firms transactions do not take place in a void but are socially embedded. Firms carry out a large share of their purchases and sales with clients and suppliers with whom they hold a long-term relationship.¹⁰ Within firms, the social relations between owners, between employers, and between owners and employers are crucial to understanding firms' behavior and development. The extent to which they develop depends on not only the type of product involved, and firm's institutional framework, but also on the preexisting social relations and culture.

In general terms, it has been suggested that when circumstances are hazardous, "transaction costs will be reduced within firms when control is on the basis of shared attitudes, goals and aspirations, either through a shared background or the creation of a business culture, rather than rules and regulations."¹¹ This would also hold for the relations between firms. Social networks thus become key to understand the development, strategy, and structure of business.

Networks reduce transaction and information costs as well as the dangers and uncertainties of business activities because they are based on social norms underpinning trust. The basic network of any individual is his or her family, but its boundaries vary; they might include an extended group of cousins, in-laws, and connections in the local business community, especially from within religious or ethnic groupings that share cultures and values. These groups represent an internal market for managerial labor, a source of funds for establishment and expansion, and a source of market information.¹² According to Granovetter's theory of the importance of weak ties, the wider a network of trust can expand beyond the family circle the more successful it

⁷ Lance E. Davis and Douglass C. North, *Institutional Change and American Economic Growth* (Cambridge, 1971); and Douglass C. North, *Institutions, Institutional Change and Economic Performance* (Cambridge, 1990): 1-5.

⁸ As defined by Mark Casson, "Institutional Economics and Business History: A Way Forward?", *Business History* (October, 1997): 151-71.

⁹ Robert H. Coase, "The Nature of the Firm", *Economica* (1937): 386-485; Oliver E. Williamson, *The Economic Institutions of Capitalism* (New York, 1985).

¹⁰ Mark Granovetter, "Economic Action and Social Structure: The Problem of Economic Embeddedness", *The American Journal of Sociology* (November 1985): 481-510.

¹¹ Rose, *Firms Networks and Business Values*, 9.

¹² Mark Casson, *The Entrepreneur* (London, 1982): 302-7; *The Economics of Business Culture: Game Theory, Transaction Costs and Economic Performance* (Oxford, 1991).

will be, since it will be able to offer more weak ties to its members through which more relevant information can flow.¹³

However, successful networks are not a given, a state of nature; they are built, and building them requires the entrepreneurship of certain individuals within the community with high intelligence, breadth of vision, and great social skills, that enable them with lower information costs than the rest.¹⁴ These entrepreneurs become the major nodes in the network that unite different individuals into a community and are often related to one another.

In Mexico the Chandlerian revolution in the production and distribution of textiles was carried out largely by several French entrepreneurs from the valley of Ubye,¹⁵ who had established themselves in Mexico in previous decades and developed important companies in the dry-goods trade supported by a network of fellow countrymen, many of whom they had helped to bring to Mexico to work in their businesses. By the 1890s the network had grown large enough to provide for a wide range of loose ties among its members. Many of them had built their own firms and become rich enough to be able to invest important sums of capital. The Barcelonnette network was ruled by strict social norms, reassuring entrepreneurs that their partners, customers, and employees would not defraud them to a much larger extent than formal institutions could. It was thus crucial in the transformation of small dry-goods shops into large wholesale and retail department stores, as well as in the transformation of the small and outdated textile mills prevailing until the 1880s into the large, vertically integrated state-of-the-art factories that began to appear in the 1890s. In order to understand how this transformation took place, this paper will explore how the Barcelonnette network came into place, how it developed, and how it worked. Focusing on a major Barcelonnette entrepreneur, Joseph Ollivier, will enable us to better understand the intricacies of this process.

The rest of this paper is structured as follows. Section I gives a general background of the evolution of the Mexican textile industry during the 19th century and the major changes Mexico experienced during the Porfiriato. Section II studies the building of the Barcelonnette network and its importance in the transformation of the textile sector. Section III analyzes the transition of small retail shops, cajones de ropa, to department stores as main channels of clothes distribution. Section IV explores the revolution in production in terms of the industry's growing scale of production, technological modernization, merging process, and adoption of organizational innovations. The section concludes.

¹³ Mark Granovetter, "The Strength of Weak Ties", *The American Journal of Sociology* (May 1973): 1360-80.

¹⁴ Casson, "Institutional Economics", 152.

¹⁵ Although immigrants came from several villages from the valley of Ubye, they have been called Barcelonnettes because this was the most important village in the area.

I. The Mexican Textile Industry during the 19th Century

“Demand for clothing as a basic need and the comparative ease with which technology had diffused internationally have helped to place textiles, especially cotton goods, in a central position in the early stages of the industrialisation of many countries,”¹⁶ and this was certainly the case in Mexico. Unlike most nearby countries Mexico developed of textile manufacturing going back to colonial times. In the late 18th century a putting-out system for the production of cotton textiles, similar to England’s developed in Mexico. In spite of setbacks to the Mexican economy due to independence wars and deindustrialization forces from the invasion of cheaper textiles that the British industrial revolution had brought about, the cotton textile industry survived and began to mechanize in the 1830s.¹⁷

Although the economy grew very little if at all during the first three quarters of the 19th century, Mexico’s textile industry continued to grow and modernize through those years. Yet, high transport costs and tariff duties charged by the different states of the federation (*alcabalas*) hindered concentration of the industry in those regions that could have hastened its development, as had occurred in other countries. In the 1870s a myriad of small and very heterogenous mills existed in almost every state of the republic that supplied their regional markets through small dry-goods shops.¹⁸

Fundamental changes in the Mexican economic environment took place during the Porfirian regime (1876-1910). After the restoration of the republic in Mexico 1867, the calamitous wars that had undermined the Mexican government’s capacity to put its finances in order and establish a reliable set of institutions gave way to a more peaceful environment. The Mexican federal government gradually gained control of the whole nation.

The more reliable environment that these post-1867 administrations generated for foreign investment, as well as active policies that granted both concessions and subsidies, led to the construction of railway lines. Given the almost total lack of navigable rivers in Mexico, the transport cost savings generated by railroads were considerable.¹⁹ Aided by political stability, an effective national government, and access to foreign credit markets, the Porfirian government gradually reorganized its public finances. Furthermore, significant legal reforms generated a more favorable and predictable

¹⁶ Mary B. Rose, “International Competition and Strategic Response in the Textile Industries since 1870”, *Business History* (November 1990): 1.

¹⁷ Rafael Dobado, Aurora Gómez-Galvarriato and Jeffrey Williamson, “Mexican Exceptionalism: Globalization and De-Industrialization 1750-1877”, *Journal of Economic History*, forthcoming.

¹⁸ Aurora Gómez-Galvarriato, “Industrial Development under Institutional Frailty: The Development of the Mexican Textile Industry in the Nineteenth-Century”, *Revista de Historia Económica* (Special Issue, 1999): 191-223.

¹⁹ According to Coatsworth, railroad direct benefits explain between 29% and 50% of the economic growth of the Porfirian era. John H. Coatsworth, *Growth Against Development. The Economic Impact of Railroads in Porfirian Mexico* (Delkab, 1981): 116-117.

institutional environment. The commercial codes of 1884 and 1889 defined property rights in a way more conducive to fostering investment, progressively guaranteeing the operation of limited liability joint-stock companies.

All these changes created the conditions necessary for the development of financial markets, and a banking system began to spread throughout the nation.²⁰ Tariff protection during the *Porfiriato* became part of a cogent policy to promote industrialization. After the tariff reform of 1891, tariffs were generally reduced, but selectively in order to protect Mexican manufacturing. In general, the tariff schedule gave effective protection to industry through higher rates for finished goods than for the imported raw materials needed to produce them.²¹

Mexico started to become a national economy for the first time since independence, and the economy began to grow substantially faster. Although the formation of a national market was a gradual process, it is clear that during the 1890s the possibility of increasing the number of customers both in the distribution and production of textiles opened up important business opportunities.

In spite of the progress in the banking system since the 1880s, financial markets in Mexico were in their infancy, and thus it was not easy to obtain long-term capital for industry. Unlike in England during the late 18th century and early 19th century, and in Mexico during the first phases of industrialization, the capital required to modernize industry and take advantage of the new opportunities was beyond the means of any one family. Lack of coal required that the mills run on hydroelectric power and be established in green-site areas, thus requiring substantially larger amounts of capital than urban steam-ran mills. Moreover the state-of-the-art textile mills of the late 19th century were far more costly than their earlier counterparts.

The textile mills built in Mexico in the late 19th and early 20th centuries were larger even than their average American counterparts, and they were owned by the companies with the most capital.

Although there has yet been no study appraising the relative quality of Mexico's institutional framework, several studies have argued that the high importance of networks in Mexican business must have resulted from the poor protection of property rights the institutional framework provided. Maurer and Sharma argue that credit through impersonal mechanisms was not common in Porfirian Mexico and that groups of entrepreneurs, particularly in textile firms, emerged to enforce property rights through a reputation mechanism that would allow them to get credit from banks.²² A similar

²⁰ Carlos Marichal, "Obstacles to the Development of Capital Markets in Nineteenth-Century Mexico", in Stephen Haber, *How Latin America Fell Behind* (Stanford Ca., 1997), 127-32.

²¹ Edward Beatty, "Commercial Policy in Porfirian Mexico: The Structure of Protection", in Jeffrey L. Borzt and Stephen Haber, *The Mexican Economy, 1870-1930* (Stanford Ca., 2002): 205-252.

²² Noel Maurer and Tridib Sharma, "Enforcing Property Rights Through Reputation: Mexico's Early Industrialization, 1878-1913", *Journal of Economic History* 61 (December 2001): 925-955.

argument is made by Maurer and Haber in an article that argues that the legal limits to the number of banks that could operate in Porfirian Mexico limited the number of textile firms that could get access to bank capital, and thus that textile firms with inside connections grew faster than those without them.²³

Musacchio and Read's study of networks of corporate directors in Brazil and Mexico shows that the number of connections between entrepreneurs was higher in Mexico than in Brazil, and that in Mexico the network was more centralized and politicians played a more important role in it than in Brazil. According to them, the network seemed to supplant formal institutions, which must have performed more poorly in Mexico than in Brazil.²⁴ It is impossible to conclude if the importance of networks in Mexico was the result of bad institutions; however, it is undeniable that networks played a particularly relevant role in this country's business activity. The literature suggests that the Barcelonnette network was one of the most important networks operating in Porfirian Mexico. Yet its relative importance vis a vis other networks has not yet been studied and lies beyond the scope of this paper. In the following pages we will analyze the importance of the Barcelonnette network in transforming the commercialization and production of textiles in Mexico.

II. A Crucial Entrepreneurial Network: The Barcelonnettes.

In 1910 there were 4,800 Barcelonnettes residing in Mexico, an astonishing figure considering that the valley of Ubaye had approximately only 17,500 inhabitants by the end of the 19th century.²⁵ This high emigration rate was exceptional for France, a country with a lower emigration rate than most European countries. Located in southeastern France at the foot of the Alps, the valley of Ubaye was then one of the poorest regions in France. Sheep and cattle raising and the spinning and weaving of wool in family shops were the basis of the economy. From the beginning of the 19th century, peddling (*colportage*) became an important economic activity in the region. Each fall between around 1,500 young men left the valley to travel through France, Italy, Belgium, and Holland to sell dry goods in small rural villages. By 1850, the development of mechanized textile mills made craft production of textiles unprofitable, damaging the Barcelonnette economy and increasing the

²³ Noel Maurer and Stephen Haber, "Institutional Change and Economic Growth: Banks, Financial Markets, and Mexican Industrialization, 1878-1913", in Jeffrey Borzot and Stephen Haber, *The Mexican Economy, 1870-1930* (Stanford Ca., 2002): 23-49.

²⁴ Aldo Musacchio and Ian Read, "Bankers, Industrialists and their Cliques: Elite Networks in Mexico and Brazil during Early Industrialization", *Entreprise and Society*, forthcoming.

²⁵ Gonzalo Castañeda, "The Barcelonnettes: An Example of Network-Entrepreneurs in XIX Century Mexico. An Explanation Based on a Theory of Bounded Rational Choice with Social Embeddedness", Document de treball No. 04/2 Department d'Economia de l'Empresa, Universitat Autònoma de Barcelona (November 2004).

number of young men ready to emigrate.²⁶ Around 7,000 Barcelonnettes came to Mexico from 1818 to 1955, most of them male (99%) and single (90%).²⁷

Letters from several young Barcelonnette immigrants tell the story. Their trips were paid for by fellow countrymen who had already established some sort of business in Mexico. The businessman financing the trip was normally well-known to the family of the person who made the trip but not necessarily a relative. Young men were housed and fed by their employers in Mexico. These letters reveal that a well-established recruiting system was in place by the turn of the century. Immigrants worked for at least a year in menial tasks for very low wages. When they had acquired sufficient knowledge of Spanish and business operations and had established a good reputation with their employers, they were upgraded to work at the shop's counter. Then, they could be further upgraded to work as accountants or traveling salesmen. Finally, four, five, or six years later, they could become partners of the business or establish their own business—often regional branches of the company they worked for. If they were lucky, after 15 or 20 years, they returned to France, married a Frenchwoman, and lived off their rents.²⁸

A study of the internal operation of a textile firm, the Compañía Industrial Veracruzana S.A. (CIVSA), shows that Barcelonnette entrepreneurs preferred to make all their long-term contracts with fellow countrymen. They sought other Barcelonnettes as partners, long-term clients, and employees in management positions.²⁹

The importance of reputation and business networks is clear in the writings of Chabrand, a Barcelonnette merchant. He wrote, "A Barcelonnette last name was equal, in a wholesale house, to a credit eight or ten times higher than normal."³⁰ Within the Barcelonnette community strict rules had to be complied with, but this had its rewards. "No Barcelonnette could buy supplies from anyone outside the commercial networks of the colony, [but] as a counterpart the suppliers gave them good facilities for payment and helped them to enlarge or open new commercial houses."³¹ This type of behavior can be explained as a form of what Oliver Williamson calls relational contracting, in which "the relation takes the form of a minisociety with a vast array of norms beyond those centered in the exchange and its immediate processes."³²

²⁶ Patrice Gouy, *Péreginations des "Barcelonnettes" au Mexique* (Grenoble, 1980), 21-38.

²⁷ Jean Meyer, "Les Français au Mexique au XIXe Siècle", *Cahiers des Ameriques Latines* (1974), 9-10.

²⁸ See, for example: "L'aventure du départ", "Les difficultés rencontrées au Mexique", "Les Lavergans à Morelia", and "Extraits de lettre et entretiens", in Maurice Proal and Martin Charpenel, *L'Empire Barcelonnette au Mexique* (Marseille, 1986), 104-21; Meyer, "Les Français au Mexique au XIXe Siècle", 58-59.

²⁹ Aurora Gómez-Galvarriato, "The Impact of Revolution: Business and Labor in the Mexican Textile Industry, Orizaba, Veracruz, 1900-1930" (Ph.D. diss., Harvard University, 1999).

³⁰ Quoted by Meyer, "Les Français au Mexique," 59.

³¹ Gouy, *Péreginations des "Barcelonnettes,"* 60.

³² Oliver Williamson, "The Governance Of Contractual Relations", in Louis Putterman and Randkall S. Kroszner eds., *The Economic Nature of the Firm* (Cambridge, 1996): 127. Williamson is partly quoting I.R. MacNeil, "Contract:

Three types of interrelated investments had to be made, according to Chandler, in order to benefit from the cost advantages of the new high-volume technologies of production and the facilities provided by the new communication and transportation systems. "The first was an investment in production facilities large enough to exploit a technology's potential economies of scale and scope. The second was an investment in a national and international marketing and distributing network... Finally,... the entrepreneurs also had to invest in management."³³ In the Porfirian textile industry this three-pronged investment was mainly undertaken within a network of French immigrants from the valley of Barcelonnette. It was these businessmen acquired the new technologies that provided economies of scale and scope. They also established new distribution networks for textile products. Finally, they invested in management, hiring and training personnel almost exclusively within the Barcelonnette community.

A. Barcelonnette Entrepreneurship and the Weaving of the Network

The first immigrant from Barcelonnette, Jacques Arnaud from Jausiers, arrived in Mexico in 1804 and was soon followed by his two brothers, Dominique and Marc Antoine. Jacques Arnaud had some entrepreneurial experience, since he had owned and managed a silk-weaving factory in Jausiers. They associated with another French immigrant, Maillefert, to open a dry-goods store specializing in textiles in 1821 in Mexico City: *El Cajón de Ropa de las Siete Puertas*. Gradually other young men from Barcelonnette followed in their wake, first working with the Arnolds and then opening their own stores. Eugène Caire, Gabriel Derbez, and Alphonse Jauffred opened a store at the Portal de las Flores in 1837, and Édouard Gassier established *La Ciudad de Londres* at a neighboring site in 1842.³⁴ By 1850 there were already nine such Barcelonnette-owned dry-goods shops in the country.³⁵

In 1845, Eugène Caire and Alphonse Jauffred returned to France after having accumulated a fortune (200,000 francs), setting a path that many young Barcelonnettes were going to try to pursue. One of them was Joseph Ollivier, who in 1850 and only 21 years old, decided to go to Mexico with the 2,000 francs he had saved from his work in a hat shop in Marseille and from a 1,000-franc inheritance he received from his father. He had been given a job at *La Ciudad de Londres* where he began on the most menial level, but very soon he started to get more responsibilities. Only four years later he was able to establish his own dry-goods store, *La Estrella de Santo Domingo* in a

Adjustments of Long-Term Economic Relations under Classical, Neoclassical, and Relational Contract Law", *Northwestern University Law Review* 72 (1978): 854-906.

³³ Chandler, *Scale and Scope*, 332-334.

³⁴ Auguste Genin, *Les Français au Mexique du XVIe siècle a nos Jours* (Paris, 1931): 364.

³⁵ Meyer, "Les Français au Mexique au XIXe Siècle", 62.

partnership with Ferdinand Jauffred, a colleague from *La Ciudad de Londres* two years older and with more social relations. Apparently the good reputation that the Barcelonnettes had established was very useful for young entrepreneurs like them, since wholesale dealers gave them particularly good credit conditions, allowing eight months for the payment of merchandise at 1% monthly interest, which was considered low in that period.³⁶

In 1862 Edouard Gassier decided to return to France and offered Ollivier and Jauffred, his former employees, *La Ciudad de Londres* under a very convenient financial arrangement that required trust, since he was leaving an important part of his capital. Ollivier and Jauffred did not have the necessary capital to set the deal, so they devised a clever financial maneuver. Ollivier and Jauffred sold *La Estrella* to a new partnership formed by Ferdinand Jauffred (the more well-off of the two) and Falque, an employee from *La Estrella* (born as Jauffred in Jausiers), who placed his savings in the new company; with the sum from that sale they acquired *La Ciudad de Londres*.³⁷

A new link in the Barcelonnette web was established, and many of the young Barcelonnettes who arrived in Mexico in the following years came to work in this store. That was the case for Joseph Tron, who worked for a year in *La Ciudad de Londres* and then moved to *Las Fábricas de Francia*, a store founded by Reynaud, Gassier and Sucesores in 1850. In 1879 Tron ended up acquiring this store, just as Ollivier and Jauffred had done with *La Ciudad de Londres*.³⁸

In 1863 a steamboat line between Saint-Nazaire and Veracruz was established, making regular monthly trips between the two ports and substantially reducing the transport costs for merchandise to 6% of what they had previously been.³⁹ This opened up important business opportunities that Ollivier and Jauffred were the first to grasp. They established a wholesale export business in France that soon displaced the Germans and Spanish from the Mexican wholesale trade. They bought either directly or from commissionnaires in Europe (with a 5% commission) the goods to be exported to Mexico. Soon afterwards Ferdinand Jauffred moved to Paris to manage the export business directly, and he married a woman from Barcelonnette. Since a large part of the merchandise exported was acquired in Manchester, Jauffred and Olivier decided to establish another wholesale trade house in that city and sent Paul Gariel (Ferdinand Jauffred's brother in law) to manage it. Soon the other major Barcelonnette entrepreneurs, Aimé Gassier, Jean Baptiste

³⁶ Jean-Louis D'Anglade, *Un Grand Patron Barcelonnette au Mexique. Joseph Ollivier et sa famille* (Sabença de la Valéia, 2006): 35-51.

³⁷ *Ibid.*, 59-62.

³⁸ Javier Pérez Siller, "Inversiones Francesas en la Modernidad Porfirista: Mecanismos y Actores", in Pérez Siller, Javier and Chantal Cramussel (coords.), *México y Francia: Memoria de una Sensibilidad Común. Siglos XIX-XX*. Vol II (Mexico City, 2004): 95.

³⁹ From 320 francs to 20 francs for 100 kgs of merchandise. Meyer, "Les Français au Mexique au XIXe Siècle", 63.

Ebrard, and Calixte Caire, would also start importing directly from Europe through similar arrangements.⁴⁰

Following a business practice common among the Barcelonnettes, in 1868 Ollivier and Jauffred invited an employee of *La Ciudad de Londres* into their partnership, Jean Baptiste Tessier. He contributed with 3,000 to the company, while Jauffred and Ollivier had 10,000 each invested. However, as was usually the case in Barcelonnette company contracts, the three associates were not on equal ground; while Jauffred and Ollivier were owner-associates, Tessier was a manager-associate, with fewer powers. The partners could not take away the capital or the benefits until the term of the partnership expired or it was dissolved. However, the partners would receive a 6% yearly rate on the benefits accumulated and on any money they placed in the company's current account. Ollivier and Jauffred increased their monthly salary from the 50 pesos stipulated in the former contract to 100 pesos and established for Tessier a salary of 40 pesos.⁴¹ This kind of association gave the manager-associates incentives to increase the company's profits but also to found their own businesses when they had accumulated enough capital, unless they expected to become the major owners of the company once their former employers left for France to retire. This was not an unlikely event; given that the owner-associates usually did not marry until they returned to France after having consolidated a fortune, their offsprings did not commonly succeed them, easing one of the problems usually present in family firms.⁴²

In 1875 another former employee, Sébastien Robert, a nephew of Joseph Ollivier, became a partner of Jauffred, Ollivier and Co. A few months later, in October, Joseph Ollivier, already 46 years old, decided to return to France and marry Henriette Ouri, establishing his home near Paris. He did not return to Mexico until four years later when the partnership was due to end. For his part, Ferdinand Jauffred decided to retire and sent his brother-in-law to Mexico with legal powers to sell his share of the company. Jean-Baptiste Tessier sold his share as well to establish his own dry-goods store in the city of Durango, in partnership with Bourillon, also from Jausiers.⁴³ This was the typical way Barcelonnettes expanded their network throughout the country. Usually the stores founded by former employees kept strong links with the stores they used to work for, buying merchandise from them through better discounts and credit arrangements.

In January, a new partnership was formed, J. Ollivier and Co., in which Joseph Ollivier held 20,000 pesos, Sébastien Robert 15,000, and Marius Robert and Sylvain Balp, both nephews of Joseph, 8,000 and 7,000 pesos,

⁴⁰ D'Anglade, *Un Grand Patron*, 65.

⁴¹ *Ibid.*, 76-79; Archivo de Notarías de la Ciudad de México, Fondo Antiguo, Notary Ignacio Cossio, Acta 5 No. 57, July 3, 1868.

⁴² This is one of the main features of the Barcelonnettes network in the model developed in Castañeda, "The Barcelonnettes: An Example of Network-Entrepreneurs in XIX Century Mexico".

⁴³ D'Anglade, *Un Grand Patron*, 110-114.

respectively. Jauffred kept some capital in the company as part of the current account, as was usually the case, with an annual interest rate of 6%.

Joseph Ollivier, who now lived in France, was in charge of the wholesale export company in Paris and was the CEO of the company. Sébastien Robert became the director of the company in Mexico. Marius Robert had responsibility for operations and accounting, and Sylvain Balp became the manager of the company in Veracruz. All of them had to report monthly to Joseph Ollivier in Paris. For his part, Ferdinand Jauffred founded the company Jauffred, Gariel and Co., with his brother-in-law Paul Gariel, who managed the wholesale export house in Manchester. This company continued to supply J. Ollivier and Co. as well as many other Barcelonnette businesses in Mexico with English products.⁴⁴

In 1873, a railroad was built between Veracruz and Mexico City, and during the 1880s many more were built, substantially reducing transport costs and facilitating trade. Once again new business opportunities opened up that required important investments both in the commercial and in the production sides of the business. Although the Barcelonnette stores sold imported products, a large percentage of their sales were from domestic coarse cloth (*manta*) produced in the Mexican textile mills which was cheaper than imports as a result of the high import duties and the continuous depreciation of the peso silver coin relative to gold. An obvious step for Jauffred, Ollivier and Co. was to become a wholesaler not only in imports but also in domestic products. In 1875 the company signed a contract with Ciriaco Marron y Carballo, a Puebla mill owner, to assure the supply of white and light brown cloth from his factory to be sold under consignment in *La Ciudad de Londres*. The domestic cloth production was not enough to supply all the Barcelonnette stores, so they competed against one another, signing contracts with different mills just as Jauffred, Ollivier and Co. had done to get enough merchandise. Yet, this was not the best arrangement they could achieve as a group. They soon realized it was a better idea to form a cartel, and since they formed a cohesive network, they were in a good position to implement it.

In June 1879 the directors of the most important Barcelonnette companies in the dry-goods business: Sébastien Robert, Joseph Tron, Édouard Ébrard, and Adolph Richaud, formed a new company Robert, Tron and Co., to purchase cloth in Mexico and to establish prices that they committed to respect. A fine of 5,000 to 20,000 pesos would be charged to those who sold at a lower price.⁴⁵ The syndicate signed exclusivity contracts with the most important textile mills of the country, taking control of a large share of the domestic cloth production. The cartelization of purchases was obviously meant to end the competition among them and increase profit margins.

⁴⁴ This was the case for CIVSA, which acquired its machinery through Jauffred, Gariel and Co. Gómez-Galvarriato, "The Impact of Revolution", 148.

⁴⁵ Archivo de Notarías de la Ciudad de México, Fondo Antiguo, Notary Ignacio Burgoa, Acta 255, June 3, 1879.

In 1884, Sébastien Robert decided to leave J. Ollivier and Co. and establish his own business. He received 317,000 pesos payable in two or three years with an annual interest rate of 6%. Sylvain Balp became the director of the company in Mexico, and a new partnership was established with other nephews of Joseph Ollivier as associates: besides Sylvain Balp and Marius Ollivier, now Antoine Ollivier and Jean Dachary joined the partnership.⁴⁶

Following in the steps of his uncle, Sébastien Robert established a wholesale exports company in Paris and in 1889, together with Firmin Manuel, who gave the store *La Valenciana* to the new company, and Joseph Pinoncely (his cousin), he established S. Robert and Co. Manuel and Pinoncely were in charge of the business in Mexico and Sébastien Robert of the wholesale export company in Paris. In 1888, S. Robert and Co. established as well a store in Buenos Aires, *La Ciudad de México*, which was not very successful.⁴⁷

With the departure of Sébastien Robert, J. Ollivier and Co. no longer represented part of the purchasing cartel formed in 1879. Joseph Ollivier realized, as the other Barcelonnettes would soon, that it was necessary to invest in the modernization of Mexican textile mills in order to expand production. In 1884 J. Ollivier and Co. formed a partnership with David Mettey and Alfred Leloup to buy the Rio Hondo textile mill, close to Mexico. Mettey managed the mill, Leloup was a technician with knowledge of the textile industry, and Joseph Ollivier was the general director. Although the three were supposed to contribute 10,000 pesos each to the partnership, in fact Joseph Ollivier gave the full amount with an interest rate of 8%, which he would recoup once the mill earned profits. The mill was bought for 12,000 pesos, and the other 18,000 pesos were used to modernize it.⁴⁸

Following a similar strategy, Signoret-Honorat and Co., Lambert-Reynaud and Co., and Garcin-Faudon and Co., also excluded from the syndicate, grouped together in 1886 in a joint-stock company, the Compañía Manufacturera de Cerritos S.A., to purchase and modernize the mill of Cerritos in the Orizaba Valley.⁴⁹ Soon after, the purchasing syndicate expanded to include them as well as other new members. The purchases of the new association were to be divided as follows: J. Ollivier and Co., 14.4%; J. Tron and Co., 14.4%; J.B. Ebrard and Co., 12.8%; Signoret-Honorat and Co., 10.4%; Lambert-Reynaud and Co., 7.2%; Garcin-Faudon and Co., 5.8%; S. Robert and Co., 7.8%; Richaud-Aubert and Co., 12.8%; and N. Bellon and Payan and Co., 5.8%.⁵⁰

However, Barcelonnette entrepreneurs were now fully aware that a new cartel to purchase the existing domestic production was not enough to reap

⁴⁶ D'Anglade, *Un Grand Patron*, 200-202.

⁴⁷ *Ibid.*, 173-192.

⁴⁸ *Ibid.*, 165-168.

⁴⁹ Meyer, "Les Français au Mexique au XIXe Siècle", 64 ; Luis Everaert, *Centenario 1889-1989* (Mexico 1989): 60.

⁵⁰ François Arnaud, *Documents et Notices Historiques sur la Vallée de Barcelonnette* (Marseille, 1981): 58.

all the benefits that the textile business could render. Investment in the textile industry was required, taking to new dimensions the strategy of those who had earlier purchased and modernized the Río Hondo and Cerritos mills.

In June 1888, J. Ollivier and Co., J.B. Ebrard and Co., and J. Tron and Co. founded the *Compañía Industrial de Orizaba S.A. (CIDOSA)* with 2, 550 000 pesos of capital, a huge amount then, which made it the largest manufacturing company in Mexico. All the associates of the purchasing company listed above participated as shareholders, with the exception of the last three companies. They invited the Escandón Arango family and Thomas Braniff to join the company to incorporate the two other mills that operated in the Orizaba Valley, Cocolapan and San Lorenzo. The Escandóns did not accept at first, but Thomas Braniff, a Welsh North American did, so that San Lorenzo became part of CIDOSA. Braniff's entry into the company was very valuable, since he was also the president of the railway line that connected Orizaba to the port of Veracruz and Mexico City. From the beginning, the company aimed to modernize the Cerritos and San Lorenzo mills, and to build a new and larger one, the Río Blanco mill. All of them would run on the electricity provided by a hydroelectric power plant also built by the company.⁵¹

Although CIDOSA was a limited liability joint-stock company whose stock was sold on the Mexican and Paris stock exchanges, only a marginal percentage of that stock was traded in those markets. From the beginning the shares were allocated among the group of Barcelonnette companies just mentioned, and they kept the majority of shares because the company's incorporation document established that any partner willing to sell stock should offer it to the other partners before placing it for sale on the market. This was the general practice followed by the joint-stock companies that the Barcelonnettes founded.

The direction of the company was in the hands of the general board. The first board was formed by Thomas Braniff as president, J. Ollivier and Co. as vice president, and J.B. Ebrard and Co. and Lambert-Reynaud and Co. as administrators. Each of these companies named representatives to the CIDOSA Board, usually the directors of the companies in Mexico City. In 1892, the Río Blanco mill opened and CIDOSA established an advisory board in Paris whose offices were at J. Ollivier and Co.; Joseph Ollivier was its president. Later on, in 1899, CIDOSA acquired a new mill, the Cocolapan, from the Escandón family. CIDOSA, as well as the other textile mills established by the Barcelonnettes, sold most of its production to its major shareholder companies through contracts established at the beginning of the year with important discounts, which gave them great control over the textile market.

⁵¹ Gómez-Galvarriato, "The Impact of Revolution", 74; Everaert, *Centenario*, 64-67.

After CIDOSA was created, several owners of dry-goods stores decided to enter textile production by becoming partners of manufacturing companies. The Compañía Industrial de Veracruzana S.A. (CIVSA) was founded in 1896 as a limited liability joint-stock corporation by several Barcelonnette entrepreneurs under the leadership of Alejandro Reynaud.⁵² Just as in the case of CIDOSA, created five years earlier, CIVSA's founding associates were not individuals but commercial firms that owned important dry-goods stores in Mexico City (see Table 2). CIVSA inaugurated a new factory in 1898, the Santa Rosa, that became the second-largest mill in the country, and, like Río Blanco, had the latest technology, including hydroelectric power.

In order to take full advantage of the new opportunities, it was necessary not only to modernize and enlarge the production side of the business but also the distribution side. In 1888 J. Ollivier and Co. rented several neighboring shops to *La Ciudad de Londres* in order to expand its building into a larger store that began to sell other products besides textiles and gradually transformed into a department store. Later on, in 1907, *La Ciudad de Londres* moved to a new and even larger building on a more important street.

However, on this ground it was Joseph Tron, Joseph Ollivier's former employee and owner of *Las Fábricas de Francia*, who took the lead, taking what J. Ollivier and Co. did to another level. In 1888 he was founded *El Palacio de Hierro*, which was to become Mexico's largest department store, as a limited liability joint-stock company (*sociedad anónima*). At first it operated on a small lot, but very soon the company began the construction of a huge building of a size previously unknown in Mexico, designed by a French architect. Its construction lasted from 1888 to July 1891, and once its doors opened, it appears to have been a highly profitable enterprise. In 1904, it reported a profit of 15% (although since most of this was reinvested, the dividend paid was only 6%).⁵³

The other major sector in which Barcelonnettes participated in Mexico was banking. The trade of textiles put them from the beginning in the credit business, since they had to sell on credit to most of their clients and to establish systems to recoup the money from those who did not pay, for which the Barcelonnette network proved to be very useful, both to share creditors' information and to share legal expenses.⁵⁴ Until the 1880s the Mexican banking system was underdeveloped even in comparison with other Latin American countries since there existed only one major bank, the Banco de Londres y México, founded in 1864.

⁵² Alejandro Reynaud, Eugenio Signoret, Sebastián Robert, Fermín Manuel, Paulino Richaud and José Jacques. Archivo de la Compañía Industrial Veracruzana (CV), Ciudad Mendoza Veracruz, Actas de la Asamblea General (AAG), Asamblea Constitutiva (organization meeting), November 24, 1896, Art. I.

⁵³ *El Economista Mexicano*, July 6, 1904, 401.

⁵⁴ In 24 companies (12 Barcelonnette, 12 from other nationalities) grouped together in 1889 to appoint Manuel Pérez and M. Dávila to recover their default credits. D'Anglade, *Un Grand Patron*, 152.

Banking opened up another area of major business opportunities for those who had the resources. In 1881, several Barcelonnette merchants grouped together around a Spanish entrepreneur, Manuel Ibañez, to found the Banco Mercantil Mexicano; among them were Ebrard and Co. and Gassier, Reynaud and Co. Then, in 1882, another bank, the Banco Nacional Mexicano, was founded, this one under the leadership of the French man Edouard Noetzlin and a majority of French shareholders, the most important of which was the Banque Franco-Egyptienne. Joseph Ollivier and Co. was one of the few Barcelonnette companies that participated in this enterprise. It held a very small percentage of the stock (400 of 80,000 shares); however, it was able to place Sébastien Robert, then manager of *La Ciudad de Londres*, on its first board, and Sylvain Balp on the board of the Veracruz branch.⁵⁵ In 1884, after a very difficult economic crisis that put the Mexican government in a terrible financial situation, the Banco Mercantil Mexicano and the Banco Nacional Mexicano merged under the name of the Banco Nacional de México.

The other major bank was the Banco de Londres y México. In 1896 several Barcelonnette entrepreneurs grouped together with other important businessmen, such as the Spaniard Antonio Basagoiti, to double its capital and take control of it. These Barcelonnettes were León Ollivier for J. Ollivier and Co., León Signoret for Signoret-Honorat and Co., Jules and Henri Tron from J. Tron and Co., Mathieu Lambert, León Honorat, and Alphonse Michel.

Several years later, in 1909, J. Ollivier and Co. once again participated in the founding of another important Mexican bank, the Compañía Bancaria de Paris y México. This was a commercial bank that sought to take advantage of the bad financial situation afflicting Mexico's major banks had been since the crisis of 1907. Several Barcelonnettes participated as partners, together with other entrepreneurs.

Having acquired a fortune, Joseph Ollivier was in a position to diversify his business and invest in several companies as a merchant-financier. Sometimes, as in the case of his investment in a factory that made fine ceramics, *La Compañía Francesa de Porcelana*, or the textile mill of *San Ildefonso*, it was part of a strategy of vertically integrating the production of certain goods that his store sold. However, other investments were completely independent from his main business, such as one he undertook with many other Barcelonnettes in a sugar plantation and sugar mill in 1900, *La Compañía Azucarera del Pánuco S.A.* In 1889 J. Ollivier and Co. held a 2,600,000 pesos share in several companies: 73% in CIDOSA, 11% in the paper company of San Rafael, 6% in the Banco de Londres y México, 5.5% in the wool mill of San Ildefonso, and the rest in the Compañía Eléctrica y de Irrigación del Estado de Hidalgo, the textile mill of la Teja, the ceramics factory Compañía Francesa de Porcelana and the Banco de Jalisco.⁵⁶

⁵⁵ Ibid., 148.

⁵⁶ Ibid., 249.

By the beginning of the 20th century the Barcelonnette network had grown to huge dimensions. While in 1850 there were only 9 dry-goods stores in Mexico, in 1864 there were already 32 retail shops and 45 wholesale shops, employing 400 Barcelonnettes. In 1890 there were 110 commercial houses; in 1910 they had increased to 214, 114 of which were in the provinces.⁵⁷

B. A Quantitative Analysis

With information from the Mexico City Notarial Archive and secondary sources, a database was built to explore the nature of the Barcelonnette network.⁵⁸ The matrix includes 94 Barcelonnette firms (columns) and their 323 partners (rows). Unfortunately, it does not include firms established outside Mexico City, except for the city of Puebla, for which secondary sources were particularly illuminating. Of the firms analyzed, 29 were associations, partnerships such as J. Ollivier and Co.; 25 were dry-goods stores; 13 were textile companies; 16 were other kinds of manufacturing companies; and 11 were banks.

Figure 1 shows how interwoven the network was. It was relatively dense; the ratio of the total number of ties between actors to the total number of possible ties that could have been made was 3%.⁵⁹ This measure was higher than what Musacchio and Read found in their network of directors in Brazil in 1909 (2%) but lower than that which they found for Mexico (between 10% and 15%).⁶⁰ The average number of partners per firm was 9, and the average number of ties (interlocks) between partners per firm was 22.63. All firms had at least one partner who was also in another firm. The average number of ties per partner was 3.55, and 50% of the partners had more than one tie.

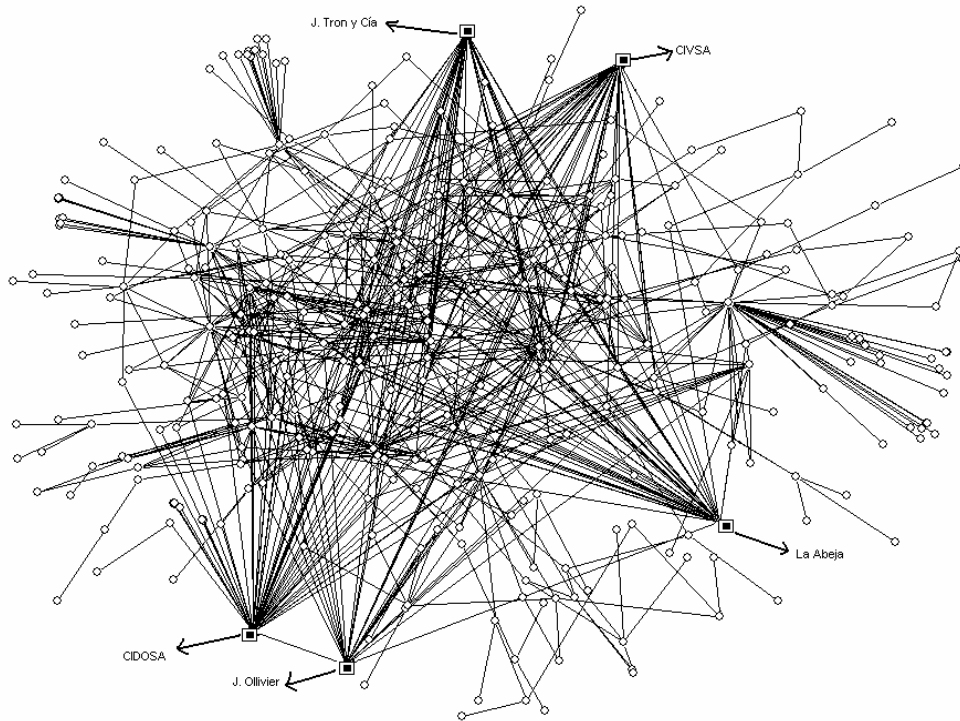
⁵⁷ Gouy, *Pérégrinations des "Barcelonnettes,"* 60.

⁵⁸ The data from the Mexico City Notarial Archive was taken from a database built with information taken from 20 notaries. In 1907 these 20 notaries made up 95% of the total firm contracts of 1907. There were 76 notaries working in Mexico City during this period, but the 20 taken for the database were the most important. The secondary sources used were: Erika Y. Galán Amaro, "Los Barcelonnettes en México, un ejemplo de espíritu empresarial (1821-1930)," B.A. thesis, Universidad de las Américas Puebla, 2005; Leticia Gamboa Ojeda, *Au-Delà de Lócéan. Les Barcelonnettes à Puebla 1845-1928* (Sabença de la Valéia, 2004); and Jean-Louis D'Anglade, *Un Grand Patron Barcelonnette au Mexique*; Pérez-Siller, "Inversiones Francesas en la Modernidad Porfirista", and Mario Cerutti and Carlos Marichal (comps.), *La Banca Regional en México (1870-1930)* (Mexico City, 2003). In the case of banks we only include Barcelonnette partners since we did not have the whole lists of shareholders but only of members on the board. Their inclusion would certainly have expanded the list of non-Barcelonnette entrepreneurs linked to the network.

⁵⁹ This measure is the binary density reported by the UCINET 6 software for Social Network Analysis.

⁶⁰ Musacchio and Read, "Bankers, Industrialists, and their Cliques," 20.

FIGURE 1. THE BARCELONNETTE NETWORK



Note: Drawing made using Pajek software.

Most of the members of the network were French (most probably Barcelonnette); only 14% of the partners had non-French last names. There were several large family groups, as far as the last names tell us: 17 partners shared the name Reynaud, 13 Signoret, 12 Manuel, 11 Caire, 8 Jean, Lions, and Ollivier. However, few of the firms in our sample could be considered family firms; 24% of the firms had 50% or more of their partners with the same family name, and only 7.4% with 80% or more. There were also several firms formed by two or more families; 11.6% of the firms were formed by two or more groups of partners with the same last name. As the case of J. Ollivier and Co. shows, there were relatives with a different last name who we cannot account for using this methodology.

In order to analyze the relative importance of the different members of the network, we ranked them according to their Eigen value centrality, a measure that takes into account not only the number of connections a member has but also the connections of those to whom that member is

connected as repeated throughout the whole network.⁶¹ Table 1 gives the names of the 10 firms and 10 entrepreneurs most central to the network, as well as the number of connections each had.

TABLE 1. CENTRALITY OF ENTREPRENEURS AND FIRMS

No.	FIRM / ENTREPRENEUR	CONNECTIONS	NEIGENVEC
1	La Abeja	56	49.58
2	Cía. Industrial Veracruzana S.A.	56	42.41
3	Robert Tron y Cia.	36	36.45
4	Cía. Industrial de Orizaba S.A.	60	32.66
5	El Leon Fábrica de Hilado y Tejidos S.C.	29	20.50
6	Cía. Industrial de San Antonio Abad S.A.	22	19.11
7	Cía. Eléctrica Robert S.A.	18	17.18
8	Cía. Eléctrica del Río de la Alameda S.A.	22	17.13
9	Robert S. y Cia.	12	15.31
10	Cía. Bancaria de Paris y México	28	11.68
1	Ollivier, Jose	25	25.53
2	Signoret, Jose	17	20.41
3	Robert, Sebastian	15	19.38
4	Robert, Desiderio	11	17.50
5	Abad, Pedro	10	17.22
6	Caire, Fermin	10	17.22
7	Chaix, Pedro A.	8	17.02
8	Honorat, Leon	9	15.98
9	Signoret, Leon	14	15.84
10	Barbaroux, Fernando	8	14.81

Note: Ranked according to their Eigenvalue centrality using UCINET software.

La Abeja, a mill that produced knitwear, ended up as the most central node of the network. Its centrality had to do with the fact that different Barcelonnette groups, each linked to a textile manufacturing company, joined in this company to get the knitted cloth their stores required. The other three most central firms were CIVSA, CIDOSA, and Robert Tron and Co., the syndicate formed by the owners of the most important Barcelonnette stores to buy domestic cloth. Among entrepreneurs, the most central was Joseph Ollivier, followed by Joseph Signoret and Sebastian Robert (Joseph Ollivier's nephew). This gives an idea of the high relative importance of Joseph Ollivier to the Barcelonnette network.

⁶¹ We follow the methodology used in Mussachio and Read, "Bankers, Industrialists, and their Cliques."

III. A Revolution in Distribution: From the “Cajones de Ropa” to Department Stores

In the United States and Western Europe the new instruments of transportation and communication transformed the way manufactured products were distributed during the second half of the 19th century.⁶² In Mexico, railroads and telegraph also brought about significant changes in the way commerce operated at the end of the 19th century, although, of course, the changes were much more limited because of the nature of Mexican markets.

A description of the Barcelonnettes' retail stores up to the 1880s gives us a clear idea of their premodern ways of operating, in that they used few modern managerial or accounting techniques. They were simple open rooms divided in two by a large counter. “In front, the boiling and chirping crowd of Indians... behind, the salesmen (*les commis*), busy, always in a hurry...” Cloth was displayed on shelves without glass. There were no hierarchy or specialization, no accounting books.⁶³

A French journalist in 1904 described the great transformation that had taken place in distribution in Mexico. If by a miracle, he wrote, a Parisian was instantly transported from the Louvre to El Palacio de Hierro, Mexico's first and biggest department store, he would not believe he was very far from the Seine River.⁶⁴

Before, since there were no fixed prices, many hours were spent bargaining. But in Mexico, just as in Paris, “progress” arrived. “Those old shops were progressively transformed, when they did not disappear completely, in order to give way to the new establishments.”⁶⁵ Old-style retail continued to exist, but by the last decade of the 19th century, in larger cities, it gave way to department stores similar to those in Europe and the United States. Department stores thus evolved from small retail shops (*cajones de ropa*) founded decades before and gradually entering wholesale trade. All of them were owned and run by Barcelonnettes (see Table 2).

⁶² Alfred D. Chandler Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass., 1977): 209-24.

⁶³ François Arnaud, “Description des Magasins”, quoted by Maurice Proal and Martin Charpenel, *L'Empire Barcelonnette au Mexique* (Marseille, 1986), 104.

⁶⁴ “Le Premier Grand Magasin Construit a Mexico”, *Le Mexique*, 1904, quoted by Gouy, 1980: 60-62.

⁶⁵ Gouy, *Pérégrinations des “Barcelonnettes”*, 60-62.

TABLE 2. FROM THE "CAJONES DE ROPA" TO DEPARTMENT STORES

NAME	OWNER	TYPE	FOUNDED	CAPITAL (PESOS)
El Palacio de Hierro				
	J. Tron y Co.	Cajón de Ropa	1888	
	J. Tron y Co.	Cajón de Ropa	Apr/1892	100,000
	El Palacio de Hierro S.A.	Grandes Almacenes	1898	4,000,000
	El Palacio de Hierro S.A.	Grandes Almacenes	1908	5,000,000
El Puerto de Liverpool				
Cajón del Puerto de Liverpool	Jean-Baptiste Ebrard	Cajón de Ropa	1847	
El Puerto de Liverpool	J.B. Ebrard y F. Fortolis	Ropa y Lencería	1851	
	Eduardo Ebrard y Co.	Cajón de Ropa	Nov/1887	5,000
	J.B. Ebrard y Co.	Cajón de Ropa	May/1894	20,000
	J.B. Ebrard y Co. Sucesores	Cajón de Ropa	Apr/1896	20,000
	J.B. Ebrard y Co.	Almacenes de Ropa	Apr/1907	935,000
Las Fábricas Universales				
	A. Reynaud y Co.	Cajón de Ropa	May/1896	45,000
	A. Reynaud y Co.	Cajón de Ropa	Mar/1910	40,000
	A. Reynaud y Co.	Cajón de Ropa	Feb/1914	102,000
	Compañía Comercial e Industrial	Casas comerciales en París, México y Cuba	Feb/1913	967,500
El Centro Mercantil				
	S. Robert y Co.	Cajón de Ropa	May/1897	150,000
	S. Robert y Co.	Cajón de Ropa	Apr/1899	240,000
	S. Robert y Co.	Cajón de Ropa	Mar/1909	300,000
	S. Robert y Co. Sucesores	Cajón de Ropa	Jul/1912	2,000,000
El Nuevo Mundo				
	Max Ma Chauvert	Ropa y Lencería	c. 1867	
	Max Chauvert y Co.	Cajón de Ropa	Jan/1889	30,000
	Max Chauvert y Co.	Cajón de Ropa	Ago/1893	222,422
	Hijas de Max Chauvert	Cajón de Ropa	Jul/1912	150,000
	El Nuevo Mundo S.A.	Grandes Almacenes	Nov/1914	2,000,000
La Ciudad de Londres				
	Jauffred, Ollivier y Co.	Gran Cajón de Ropa	1863	10,000
	Ollivier y Co.	Cajón de Ropa	1872	50,000
	J. Ollivier y Co.	Cajón de Ropa	1875	70,000
	J. Ollivier y Co.	Cajón de Ropa	1889	40,000
	J. Ollivier y Co.	Cajón de Ropa	1894	81,000
	J. Ollivier y Co.	Cajón de Ropa	1898	166,000
	J. Ollivier y Co.	Cajón de Ropa	1904	170,000
El Puerto de Veracruz				
	Signoret, Honnorat y Co.	Cajón de Ropa	Aug/1888	12,000
	Signoret, Honnorat y Co.	Cajón de Ropa	Jun/1892	100,000
	Signoret, Honnorat y Co.	Grandes Almacenes	1907	250,000

Notes: a) cajón de ropa, b)grandes almacenes, c)ropa y lencería, d)almacenes de ropa, e)casas comerciales, f)lencería, g)negocios mercantiles. Sources: México, SHCP, "Noticia de las Sociedades que se han registrado en la Oficina del Registro Público de la Propiedad y del Comercio, desde el 15 de enero de 1886 hasta el 31 de diciembre de 1910," 46-287; Maillfert, 2002, *Directorio del Comercio del Imperio Mexicano*; Librería de la Vda. De Ch. Bouret, 1897, *Almanaque Bouret 1897*; Gouy, 1980, 135.

In Mexico City, then a city of over 300,000 inhabitants, El Palacio de Hierro, El Puerto de Liverpool, Las Fábricas Universales, El Puerto de Veracruz, El Correo Francés, La Ciudad de Londres, and El Centro Mercantil changed the commercial and even architectural scene. They were the highest buildings in Mexico City in that era. Department stores also opened in other

Mexican cities, such as Guadalajara, San Luis Potosí, Mazatlán, Durango, and Puebla.⁶⁶

The creation of El Palacio de Hierro was very influential in the evolution of commerce in Mexico City, since others soon followed in its path. At first, El Palacio de Hierro's directors wanted to organize the company exactly according to the practices followed by the most important department stores in Paris. However, they later decided that it was not a good idea to break so drastically with Mexican traditions. Thus, they decided to keep a counter that separated the employee from the client on the ground floor. But one important innovation was introduced: the fixed price, "a system that was applied and maintained with rigor." It was not easily accepted by the clientele, even though "it is so practical and simple" and helped save so much time otherwise lost in bargaining. "The directors of El Palacio de Hierro had to deploy patience and tenacity in order for this new practice to be adopted."⁶⁷

Despite the modernizing spirit of El Palacio de Hierro's businessmen, they maintained the old recruiting procedures, almost exclusively employing young Barcelonnettes who were housed and fed on the company premises. The fourth and fifth floors of the company's building were used to lodge its employees, most of whom lived and dined there.

El Palacio de Hierro vertically integrated the production of several articles. Women's clothing and lingerie, ties, shirts, parasols, umbrellas, and furniture were manufactured on its own premises. Furthermore, in 1889 El Palacio de Hierro became the major partner of the Compañía Industrial de Orizaba S.A. (CIDOSA), Mexico's largest textile firm, which owned four textile mills in the Orizaba Valley. El Palacio de Hierro was not exclusively a retail store; wholesale trade was a major part of its business. It operated as the center of a wide network of stores—generally run by Barcelonnettes—throughout Mexico. The delivery department organized the orders placed by merchants all over the country and quickly packaged the products and sent them off to them. The company owned several horse-pulled wagons that took goods from the store to the railway station, or any other place in Mexico City, on the day of purchase.⁶⁸ The modernization that El Palacio de Hierro undertook was not an isolated case; as Table 2 shows, most Barcelonnette stores undertook, to a lesser or greater degree, a similar process.

⁶⁶ Proan and Charpenel, *L'Empire Barcelonnette au Mexique*, 34-60.

⁶⁷ *Le Mexique, 1904*, quoted in Gouy, *Pérégrinations des "Barcelonnettes"*, 60-63.

⁶⁸ *Ibid.*

IV. A Revolution in Production

The Porfirian revolution in textile production had four major characteristics: (1) an increase in scale; (2) a modernization of machinery and utilization of electricity as a major source of power; (3) a merger of mills into joint-stock companies owned by major textile distribution companies, generally the property of Barcelonnettes, except in the northern states; and (4) a relative separation of ownership and management.

An important share of the Porfirian textile industry's growth took place as part of this process. The companies listed in Table 3 were responsible for 81% of the national growth in the number of spindles from 1878 to 1893 and for 46% from 1893 to 1912. In the textile industry in the north of Mexico, a similar process seems to have taken place, as Monterrey entrepreneurs had to keep pace with the changes in the Barcelonnette mills. Modernization, both in terms of an increase in scale and in the formation of limited liability companies, was undertaken mainly by Mexicans and Spaniards from Santander in the north of Spain.⁶⁹

⁶⁹ Mario Cerutti, *Burguesía, Capitales e Industria en el Norte de México* (Mexico City, 1992): 231-32.

TABLE 3. MAJOR TEXTILE COMPANIES IN 1912

COMPANY	FOUNDED	TEXTILE MILLS	STORES OWNED BY ASSOCIATES	ASSOCIATES
Compañía Industrial de Orizaba S.A.	1889	Cerritos	El Palacio de Hierro	Tomás Braniff, J. Ollivier y Cía., J.B. Ebrard y Cía. J. Tron y Cía., Signoret, Honnorat y Cía., Lambert, Reynaud y Cía., Garcin Faudon y Cía., Juan Quinn
		Cocolapan	El Puerto de Liverpool	
		San Lorenzo	La Ciudad de Londres	
		Río Blanco	Francia Marítima	
			El Gran Oriental	
Compañía Industrial Veracruzana S.A.	1896	Santa Rosa	Las Fábricas Universales	A. Reynaud y Cía., S. Robert y Cía., F. Manuel y Cía., P. y J. Jacques y Cía., Paulino Richaud
		El León (1920)	La Ciudad de México	
			El Centro Mercantil	
			La Reforma del Comercio	
Compañía Industrial de San Antonio Abad S.A.	1892	San Antonio Abad	La Reforma del Comercio	Iñigo Noriega
		La Colmena Barrón		Adolfo Prieto
		Miraflores		Agustín Garcin
Compañía Industrial de Atlixco S.A.	1902			Enrique Monjardín
		Metepec	La Reforma del Comercio	B. Rovés y Cía., A. Richaud y Cía., S. de Juanbelz y Cía., Solana Barrenche y Cía., Antonio Basagoiti, Luis Barroso Arias, Agustín Garcin, Leopoldo Gavito, Félix Martino, Benjamín Ochoa, Iñigo y Constantino Noriega, soter de Juanbelz, Emilio André, Eduardo Vega y Santiago Aréchaga
Compañía Industrial Manufacturera S.A.		Hércules	Las Fábricas Universales	Agustín Garcin, Joseph Signoret, Brun, Lerdo de Tejada, (1905) Cuzin, Fortoul Bec, Lèbre and Brun
		San Antonio	La Reforma del Comercio	
		La Purísima	La Ciudad de Londres (Guad.)	
		La Sultana		
		La Teja		
Compañía Industrial de Jalisco/Compañía Industrial de Guadalajara S.A.	1899	Río Blanco (Jalisco)	La Ciudad de Londres (Guad.)	Fortoul Chapuy y Cía., Gas y Cía., Laurens Brun y Cía., Bellón Agoneca y Cía., E. Lèbre y Cía.
		Atemajac	Las Fábricas de Francia (Guad.)	
		La Escoba		
Compañía Industrial de San Ildenfonso S.A.		San Ildenfonso	El Puerto de Liverpool	J.B. Ebrard, H. Reynaud and E. Pugibet
			Francia Marítima	
J. y L. Veyan y Co.	1898	La Magdalena	El Centro Mercantil	Meyrán Donnadiou & Co., (1912) Adrien Jean and Luis Veyan
		Santa Teresa	La Valenciana	
		Río Florido		

Sources: See Table 2 and Durand, 1986, 54-55, 62; Beato, 1981, 48; Trujillo, 1997, 265-270; Everaert, 1990, 59-67, CIVSA, Actas de la Asamblea General, November 24, 1896.

Greater mill scale was concomitant with the reduction in transportation costs. Río Blanco, Santa Rosa, and Metepec almost tripled the size of the largest mills that existed in 1878. Between these dates, while the number of

mills increased, average mill size grew even more, as can be seen by the growth of the average number of spindles per mill. In 1880 the average number of spindles per mill in the United States was 14,092, while in Mexico it was 2,918, a small figure even when compared with that of the southern states of the U.S. (3,367).⁷⁰ In order to produce with technology like that used in the United States, mills had to increase their size. Although economies of scale are not as important in the textile industry as in some other industries, there was something to be gained by increasing size and integrating processes.⁷¹ In 1878, 33% of mills had fewer than 1,000 spindles, a figure that declined to 21% by 1893 and 2% by 1912.

Mills not only grew in size but also modernized. Whereas in 1893 new spindles represented only 37% of total spindles in the industry, by 1913 they accounted for 96% of them. For looms, these proportions were 43% and 93%, respectively.⁷² New textile firms produced a wider variety of cloth than older mills. Whereas until 1878 Mexican mills manufactured almost exclusively yarn and coarse cloth (*manta*), these new firms introduced the production of higher-quality-cloth.⁷³

Furthermore, mills underwent a transformation in their power source, changing from water power to electricity. Given the scarcity of coal in the country, hydroelectric power produced important savings and was therefore rapidly introduced. In 1894, only two years after the installation of the first electric generators to power textile mills in the United States, San Ildefonso in Mexico City began to move its machinery using electric power.⁷⁴ Two years later, CIDOSA supplied electric power to its four mills. In Puebla, the San Antonio Abad mill and the Compañía Industrial de Atlixco began to run on electricity in 1896 and 1899, respectively. In 1898, when Meyran, Donnadiou and Co. acquired La Magdalena Contreras, they built a hydroelectric power plant that provided electricity not only for its mill but also to supply La Hormiga, La Alpina, and the Loreto paper mill.⁷⁵ Many other mills followed. Textile mills soon became a major producer of electricity in the country. San Ildefonso, CIVSA, and CIDOSA, like most other textile mills in Mexico, produced their own electricity mainly through hydroelectric generators installed at the waterfalls they held under concession.⁷⁶

⁷⁰ In New Hampshire, Maine, and Massachusetts, the average number of spindles per mill in 1880 was 25,004.

⁷¹ Armando Razo and Stephen Haber, "The Rate of Growth of Productivity in Mexico, 1850-1933: Evidence from the Cotton Industry", *Journal of Latin American Studies*, vol. 30, no. 3: 1-37.

⁷² Unfortunately, Porfirian data does not specify what is meant by old and new machinery.

⁷³ Archivo de la Compañía Industrial Veracruzana, Ciudad Mendoza, Veracruz (CV), Price List, 1907. It includes 74 different items.

⁷⁴ Dawn Keremitsis, *La Industria Textil Mexicana en el Siglo XIX* (Mexico City, 1973): 102; and Ernesto Galarza, *La Industria Eléctrica en México* (Mexico City, 1941): 12.

⁷⁵ Mario Trujillo Bolio, "La Fábrica Magdalena Contreras (1836-1910)", in Carlos Marichal and Mario Cerutti (comps.) *Historia de las Grandes Empresas en México 1850-1930* (Mexico City, 1997): 245-74.

⁷⁶ Ernesto Galarza, *La Industria Eléctrica en México*, (México City: FCE, 1941), 12-14.

Modernization and an increase in scale followed the merging of textile mills into conglomerates and concentration in the industry's structure. Whereas in 1879 the four biggest mills produced 16% of total sales, by 1902 this figure had risen to 38%. Thereafter a slight deconcentration seems to have occurred, since this figure declined to 27% by 1912.⁷⁷ As can be seen in Table 4, eight textile conglomerates founded by the turn of the century owned only 12% of the 148 mills that existed then but 41% of the spindles, 45% of the looms, and 60% of the printing machines of the entire industry. These companies employed 38% of the labor force in the industry and paid 40% of the taxes. Moreover these firms produced all of the higher quality clothes, whereas the rest produced mostly coarse clothes (*mantas*). Barcelonnettes held the majority of the shares in most of these firms. Large-scale firms, often the product of mergers, arose not only to improve efficiency or guarantee access to raw-material supplies but also to gain market control, as the case of Robert Tron and Co. clearly illustrates.⁷⁸

TABLE 4. MAJOR COTTON TEXTILE COMPANIES IN 1912

	MILLS NO.	MILLS %	SPINDLES	LOOMS	PRINT. MACH.	LABOR	SALES	TAXES	COTTON CONS.	YARN PROD.	CLOTH PROD.
Cía Ind. de Orizaba S.A.	4	3%	12%	9%	20%	13%	13%	15%	11%	0%	14%
Cía Ind. Manufacturera S.A.	4	3%	5%	5%	6%	4%	3%	3%	3%	0%	3%
Cía Ind. Veracruzana S.A.	1	1%	5%	5%	8%	5%	6%	7%	4%	0%	4%
Cía Ind. San Ant. Abad S.A.	3	2%	5%	4%	8%	4%	4%	4%	3%	2%	3%
Cía Ind. de Atlixco S.A.	1	1%	5%	6%	10%	4%	5%	5%	3%	0%	4%
Cía Ind. de Guadalajara S.A.	3	2%	3%	3%	4%	2%	2%	2%	2%	0%	2%
La Hormiga S.A.	1	1%	3%	2%	0%	3%	2%	2%	2%	2%	2%
Veyan Jean y Cía. S. en C.	1	1%	2%	6%	4%	3%	3%	3%	3%	0%	4%
Total	18	12%	41%	45%	60%	38%	38%	40%	31%	4%	36%

Sources: 1912: AGN, DT 5/44 "Manifestaciones presentadas por los fabricantes de hilados y tejidos de algodón durante enero a junio de 1912."

⁷⁷ Stephen Haber, "Financial Markets and Industrial Development: A Comparative Study of Government Regulation, Financial Innovation, and Industrial Structure in Brazil and Mexico 1840-1930," in Stephen Haber, *How Latin America Fell Behind* (Stanford Ca., 1997): 163.

⁷⁸ This argument is developed very convincingly in Naomi Lamoreaux, *The Great Merger Movement in American Business, 1895-1904* (Cambridge, 1989).

Changes in the textile business also transformed the way firms were internally managed. Older textile companies in Mexico were traditional family firms in which owners managed and managers owned; capital stock stayed in the hands of a few individuals or families that rarely hired more than two or three managers. In contrast, the new firms that appeared at the turn of the 19th century, developed a peculiar organizational structure, midway between a personal and a managerial firm, with several other particular features.⁷⁹ As we have seen in the case of J. Ollivier and Co., the structure of the Barcelonnette companies evolved through the 19th century from small firms directly managed by their owner to companies with several partners in which the largest shareholder was frequently living in France. Moreover, firms like J. Ollivier and Co. became the partners of larger firms such as El Palacio de Hierro, CIDOSA, or CIVSA in which management and ownership were relatively separate.

CIVSA's internal organization gives us interesting insights into its most salient characteristic. Although the Reynaud family owned a majority of the company's shares throughout the period studied, CIVSA was not a family business. The Reynauds did not run CIVSA; instead, the board, representing the various commercial firms that owned CIVSA, managed the company. Yet A. Reynaud & Co. controlled the board's presidency for most of the period studied. Members of the board often contested the president's opinions. However, although every board member had a vote, when positions about any issue were divided, the president's vote had extra weight and determined the course of action to be taken.⁸⁰ Nonetheless, there was some separation between ownership and management in CIVSA's operation. Commercial firms participated on CIVSA's board as business associations, not through the personal involvement of their major owners. That CIVSA shareholders were companies and not individuals was already clearly established in the firm's incorporation articles.⁸¹ These firms were generally represented on the CIVSA Board by the general directors of those companies in Mexico, who also managed the department stores.⁸² With very few exceptions, board members were part of the tightly knit Barcelonnette network.

CIVSA's board of directors was located in Mexico City, the site of the company's headquarters. Until 1911, the Mexico City offices were managed by the president of the board of directors and the Santa Rosa mill by a general manager, appointed by the board of directors, who lived on the mill's

⁷⁹ Chandler, *The Visible Hand*, 9-10.

⁸⁰ This happened, for example, in December 1917. The members votes were split in regards to the discounts to be set, so the president's "vote of quality" set the dispute in favor of his proposal. AC, CV, December 4, 1917.

⁸¹ CV, AAG, Asamblea Constitutiva, November 24 1896. Art. 35

⁸² This was the case for Joseph Signoret, president of the CIVSA Board in 1897 and 1906-1907. He was head of A. Reynaud & Co. in Mexico and manager of Las Fábricas Universales. In 1896 and 1898-1905 he was replaced on the board by his brother Eugenio Signoret. Sébastien Robert was vice president of the CIVSA Board in 1896; from 1897 to 1911 the vice president was his associate, Emile Meyrán, head of S. Robert & Co. in Mexico and manager of El Centro Mercantil and La Valenciana.

premises. When board members visited Santa Rosa they were not to interfere in the manager's duties "and leave to him the complete administration of the factory, even when they are informed of complaints or demands of the employees."⁸³ Daily correspondence went back and forth between the board's president in Mexico City and Santa Rosa's manager; thus, railroads and the telegraph were crucial to CIVSA's management.

The board held weekly meetings at which most of the company's strategy was decided.⁸⁴ In these meetings members decided all matters regarding input purchases, allocation of financial assets, recruitment and appointment of Santa Rosa's employees, sale policies, negotiations with unions, and the company's relations with the government as well as with other companies and industrial associations. Reports of production and costs were sent weekly from Santa Rosa to the Mexico City offices. The board analyzed them and sent alarm signals to the mill whenever it found unexplained changes in the accounts demanding solutions.⁸⁵

From the outset, the mill's organization was divided into several departments corresponding to the various production processes. In 1926 there were six technicians and 16 clerical and staff employees under the general manager's control. In all, 165 clerical and staff employees and 3,267 blue-collar workers were employed by CIVSA that year.⁸⁶ All white-collar workers were foreign, clerical and staff employees were generally Barcelonnette, whereas technicians were generally Europeans hired by A. Reynaud and Co. in Paris, sometimes with the aid of Jauffred, Gariel and Co. These two companies also supplied CIVSA with the machinery and chemicals required.

By 1911, several of CIVSA's founding associates or former board members had left Mexico for Paris. Thus, in March 1911, A. Reynaud & Co. in Paris proposed the creation of the Paris Advisory Committee (Comité Consultatif de Paris), common among Barcelonnette companies.⁸⁷ The Paris Advisory Committee was constantly in contact with the board and with the general manager of CIVSA. It received weekly reports on production, costs, sales, and the firm's financial standing. Formally, the committee's role was merely advisory, but in practice it had great influence over the major decisions taken

⁸³ CV, AC, September 3 1900.

⁸⁴ Board members were obliged to attend these meetings; those who did not, had to pay a 10 peso fine unless they were away from Mexico City. CV, AC, January 19, 1897.

⁸⁵ During the first ten years of CIVSA's operation a member of the board traveled weekly to Santa Rosa, and all board members met at Santa Rosa during the last week of December. After 1911 visits of board members to the mill, although still frequent, became less regular.

⁸⁶ There were 21 clerical and staff employees working in Mexico City offices, 88 in Santa Rosa, 36 in Covadonga, and 20 in El León. There were 1,730 workers in Santa Rosa, 989 in Covadonga, and 548 in El León. CV, Anexos a la declaración del Income-Tax, Resumen de Profesionistas, Empleados y Obreros con los emolumentos que percibieron en el año de 1926.

⁸⁷ CV, AC, March 28, 1911. Art. 3 of the statutes was modified to allow the company to have special offices in foreign countries, run by consultant advisors (*consejeros consultivos*) or their managers. CIVSA, AAG, April 25 1910.

by the board of directors. Furthermore, it had a prominent role in the firm's financial management.⁸⁸

An important characteristic shared by Barcelonnette companies was that although in many aspects they modernized in quasi-Chandlerian ways, they kept a traditional core by carrying out most of their transactions—financial, laboral, or commercial—within the Barcelonnette network. That big department stores such as El Palacio de Hierro kept a floor to lodge their Barcelonnette personnel illuminates this idea.

This strategy and structure were not accidental, but an organizational innovation it developed from the experience of different Barcelonnette companies as they grew. An inter-institutional learning experience seems to have taken place, whereby innovations made by one firm were rapidly adopted by others. Similarities between firms, whether the result of imitation or independent parallel developments, indicate that the strategy and structure they followed was an organizational innovation well adapted to Mexico's economic, social and political environment.

⁸⁸ For example, in 1917, CIVSA's general manager wrote to the Advisory Committee in Paris that the board had thought of paying a \$2.50 dividend. "In case of approval the remaining profits will be distributed in the 'insurance' and 'risk precaution' accounts. We await your opinion. Cable the word May to mean 1 dollar, June to mean 2 dollars and July to mean 2.50 dollars." CV, AC, April 12, 1917.

Conclusions

When the optimal scale and scope of production and distribution are relatively small, the capital a business requires can be accumulated by a single entrepreneur or his family. Accordingly, the management required to organize this small firm's operations may be provided by the owner himself or his family. During the Porfiriato, substantial investments in transportation and communication infrastructure, together with important political and institutional changes, integrated Mexico into a national market. An expansion in the efficient scale and scope of production took place in many industries that enabled firms to adopt recent manufacturing technologies.

These innovations had to be coupled with developments in financial strategies and managerial structures in order for firms to exploit economies of scale and scope. In order to supply a larger market, it was necessary to transform commercialization, creating distribution networks that integrated as directly as possible producers and consumers. In order to take advantage of the cost reductions new manufacturing technologies offered, it was necessary to modernize and enlarge the mills. Both transformations required large amounts of capital, not easily available in the financial environment of the Porfiriato.

In spite of the considerable institutional changes that Porfirian Mexico experienced, they were not large, broad, or fast enough to guarantee certainty in legal contracts; create financial institutions that could provide investment capital to promising, well-backed projects, irrespective of the name of the entrepreneur; or permit a general diffusion of education. Thus, realizing the profits that the transformation of business promised was limited to those that were able to amass important sums of investment capital; and set up organizations abundant in human capital and trust, in a country where both factors were scarce.

In the case of commercial business, the sums required could often be put together either personally or through one's family. Yet, in the case of large industrial enterprises (such as CIVSA or CIDOSA) or in the case of the larger commercial business (such as El Palacio de Hierro), the required amount of investment capital, was more than a family could provide. Furthermore, they were too large for a single entrepreneur (or his family) to manage. Several people or families needed to put their capital together and cooperate in the firm's management. If large enough amounts of capital could not be raised through financial institutions, it could only be raised through the trust between entrepreneurs that a well-knitted social network could provide, and this is what the Barcelonnttes endeavored

to do.⁸⁹ The solution was to join the capital of several commercial firms, the few institutions with the necessary liquidity in Mexico in those times, and divide management responsibilities among them. Since these firms were already well acquainted with the textile distribution business, their partnership served yet another purpose: It guaranteed sales and provided industrial enterprises with the necessary market knowledge for their products from the outset.

Doing business within the Barcelonnette ethnic network, ruled by rigid social norms, reassured entrepreneurs that their partners, customers, and managers would not defraud them, important since fraud would have been difficult and costly to redress legally. In this context, it is easy to understand why ethnic groups such as the Barcelonnettes became so prominent in the Mexican economy, and in particular in the revolution in distribution and production that took place in the textile industry. It also explains Mexico's relatively concentrated industrial structure.⁹⁰

Yet, networks are not spontaneously born, they are the product of the entrepreneurship of certain individuals who, as the case of Joseph Ollivier shows, are nodal to the network structure and development. The study of the Barcelonnette network shows the importance of those entrepreneurs who arrived earlier in Mexico to the formation of the first network, since the strategy for their business success was based on the construction of the network itself. Those who came later, such as Joseph Ollivier, would take advantage of the early network and use their entrepreneurial abilities not only to expand their business but also the network, and in so doing, allowed an expansion of the businesses of the other network members.

⁸⁹ Although CIVSA got several short-term loans from banks which facilitated day-to-day operations its investment capital came from the shares bought mostly by Barcelonnette entrepreneurs. The cases of CIDOSA and CIASA were similar. See, Aurora Gómez-Galvarriato and Gabriela Recio, "The Indispensable Service of Banks: Commercial Transactions, Industry, and Banking in Revolutionary Mexico", *Entreprise and Society*, vol.8, no.1 (March 2007): 84-91. In the case of smaller textile mills there were cases where some investment capital came from banks, yet even in this case the Barcelonnette network was crucial since insider-lending prevailed as shown in Haber and Maurer, "Institutional Change and Economic Growth".

⁹⁰ Haber, "Financial Markets", 163.

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