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Yovanna Pineda

Financing Manufacturing Innovation in Argentina, 1890–1930

Between 1890 and 1930, Argentina's manufacturers invested in imported machinery. Although they aligned with political allies to advance and protect their companies, their dependence on imported machinery, raw materials, fuel, and expensive skilled labor were obstacles to their success. Two factors slowed the progress of these entrepreneurs: their lack of technological capabilities and the absence of government policies to address the problems entailed in importing foreign machinery. Several political factions supported industry's efforts to reduce dependence on imported products and to diversify the economy. While these supporters hoped to promote industry through the passage of legislation to raise the tariff rate, their strategy represented a compromise that stifled the drive to innovate that is so necessary for long-run economic growth and industrial development.

While industrialization in developing nations depends on a number of factors, some scholars believe that trade strategy is the main determinant of its success.¹ Although trade policy is important, industrialization also requires economic growth, access to technology, business culture, and global markets.² Economist André Hofman makes

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¹Sanjay Lall, "Explaining Industrial Success in the Developing World," in *Current Issues in Development Economics*, ed. V. N. Balasubramanyam and Sanjay Lall (London, 1991), 119; Alan M. Taylor, "Argentina and the World Capital Market: Saving, Investment, and International Capital Mobility in the Twentieth Century," *Journal of Development Economics* 57, no. 1 (1998): 147–84.

²Shapiro and Taylor concentrate on seven sets of conditions: Helen Shapiro and Lance Taylor, "The State and Industrial Strategy," *World Development* 18, no. 6 (1990): 861–78. Kim focuses on access to technology and the build-up of technological competencies: Linsu Kim, *Imitation to Innovation: The Dynamics of Korea's Technological Learning* (Cambridge, Mass., 1997). And Davis analyzes the power of the middle classes. See also Diane E. Davis, *Discipline and Development: Middle Classes and Prosperity in East Asia and Latin America* (Cambridge, U.K., 2004).

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the argument for “factors related to economic growth which are difficult to quantify in economic or statistical models,” citing economic policy, socioeconomic groups, and even historical accidents.³

In this article, I examine how four interrelated factors—business cycles, investment in machinery, domestic entrepreneurship, and economic policy—affected Argentina’s industrial development from 1890 to 1930. Until 1930, Argentina was a major Latin American economy, importing from 30 to 50 percent of all the intermediate and capital goods entering the region.⁴ But, between 1929 and 1950, the country’s economy declined to a level below that of any other Latin American nation.⁵

Argentina’s economic downturn and its failure to complete its industrialization have long intrigued scholars of Latin American economic history. They find the outcome puzzling, because the country’s agricultural wealth, large-scale European immigration, strong ties to international markets, and growing capital institutions should have ensured a formidable industrial base. Despite the presence of these favorable attributes, however, the country never produced a strong and sustainable manufacturing sector.

I begin the article by discussing how business cycles, investment in machinery, policy, and domestic entrepreneurs influenced the country’s industrial outcome between 1890 and 1930. Next, I estimate the amounts that were invested in imported machinery and trace the fluctuating patterns of investment. Few studies of this topic have produced estimates of the actual amounts spent on manufacturing machinery during this period.⁶ Even fewer have analyzed the reasons for the troughs and peaks of these investments.

Finally, I look at the manufacturing sector, exploring the interplay between entrepreneurship, problems with foreign machinery, and labor and tariff policy in order to discover why tariff policies were the favored solutions to industrial problems. The early literature on the industrialization of Argentina tended to blame the state and entrepreneurs for

³ André A. Hofman, *The Economic Development of Latin America in the Twentieth Century* (Northampton, Mass., 2000), 2.

⁴ Based on estimates from a paper by Xavier Tafunell and Albert Carreras, “Capital Goods Imports and Investment in Latin America in the Mid-1920s,” 2007 (available on line: <http://www.emagister.com/capital-goods-imports-investments-latin-america-mid-1920s-cursos-1615321.htm>); Hofman, *The Economic Development of Latin America*; Sara Caputo de Astelarra, “La Argentina y la rivalidad comercial entre los Estados Unidos y Inglaterra (1899–1929),” *Desarrollo económico* 23, no. 92 (1984): 589–605.

⁵ Hofman, *The Economic Development of Latin America*, 39–40.

⁶ The U.N. Economic Commission on Latin America created indices of machine imports for Argentina, but only after 1945. Jorge Katz and Bernardo Kosacoff discuss this topic in *El proceso de industrialización en Argentina: Evolución, retorcero y perspectiva* (Buenos Aires, 1989).

these protective policies.⁷ Most of the studies shared a similar conclusion: the Argentine government and manufacturers were responsible for the nation's failure to develop a sustainable industrial sector. The authors viewed the manufacturers as rent seekers and the government as an enabler that permitted leading manufacturers to impose their inefficiencies on the economy.⁸ Economist Andrés López argues that the stereotype of the rent-seeking manufacturer does lead to an understanding of the incentives motivating private businesspeople and the initiatives they took.⁹ But rather than labeling Argentine businessmen as "genetically predisposed" to rent-seeking behavior, we must examine them in their environment, which includes the finance markets, the business culture, and the technological constraints that they faced.¹⁰

Between 1890 and 1930, Argentina's manufacturers acted in a rational, self-interested manner on the basis of limited information in a volatile investment climate that offered few lending opportunities. By investing in imported machinery and aligning themselves with political allies who protected their interests, they extended the lives of their companies. But the basic problems of industry persisted because they were never addressed directly. Manufacturers' continued reliance on imported machinery perpetuated their dependence on imported raw materials, fuel, and expensive skilled labor. Two factors obstructed the progress of these entrepreneurs: their lack of technological capabilities, and the absence of government policies to address problems resulting from the importation of foreign machinery.

Data and Methods

This article is based on two newly created data sets of investment cycles and business groups. The first gauges Argentine investment in

⁷ Adolfo Dorfman, *Historia de la industria argentina* (Buenos Aires, 1942); Juan Carlos Korol and Hilda Sábato, "Incomplete Industrialization: An Argentine Obsession," *Latin American Research Review* 25, no. 1 (1990): 7–30.

⁸ Barbero asserts that the Argentine entrepreneur is traditionally viewed as either an innovator or a rent seeker. María Inés Barbero, "La historia de empresas en la Argentina: Trayectoria y temas en debate en las últimas dos décadas," 153–69, in Jorge Gelman, ed., *La historia económica argentina en la encrucijada: Balances y perspectivas* (Buenos Aires, 2006).

⁹ Andrés López, *Empresarios, instituciones y desarrollo económico: El caso argentino* (Buenos Aires, 2006), 3–5.

¹⁰ López, "Empresarios," 5; Mark Casson, "Entrepreneurship and Business Culture," in *Entrepreneurship, Networks and Modern Business*, ed. Jonathan Brown and Mary B. Rose (Manchester, 1993), 30–54; Andrés M. Regalsky, "La evolución de la banca privada nacional en Argentina (1880–1914): Una introducción a su estudio," in *La formación de los bancos centrales en España y América Latina*, vol. 2: *Suramérica y el Caribe*, ed. Pedro Tedde and Carlos Marichal (Madrid, 1994), 35–59; Carl Dahlman, Bruce Ross-Larson, and Larry E. Westphal, "Managing Technological Development: Lessons from the Newly Industrializing Countries," *World Development* 15, no. 6 (1987): 759–75.

imported machinery, machine parts and accessories, and fuel. An approximate value of machine investment in Argentina was obtained by examining the exports of machinery from four countries, specifically Germany, the United States, the United Kingdom, and France. Wilson Suzigan, in *Indústria Brasileira* (1986), used this method to determine machine investment in Brazil.¹¹ For my study, I took data for the U.S. and U.K. trade series from the serial publications *Annual Statement of the Trade of the United Kingdom with Commonwealth Countries* and *The Foreign Commerce and Navigation of the United States*. Data from the German government trade series came from *Statistik des Deutschen Reichs*, 1890–1929, and the French trade data were derived from *Tableau general du commerce et navigation*, 1890–1928.¹² All data values were converted to real pounds sterling, based on a capital-goods price index for plant and machinery from 1890 to 1930.¹³

A second data set consists of information compiled on 1,282 company directors from fifty-nine companies across ten manufacturing sectors between 1890 and 1930.¹⁴ Because of space limitations, I present examples from two main business groups: the Bemberg and Tornquist groups. This data set traces company directors' affiliations to banks, government institutions, insurers, manufacturing companies, and mercantile firms. It also identifies directors' membership in the chamber of commerce of the Buenos Aires Stock Exchange, the Jockey Club, the Sociedad Rural Argentina, and the Unión Industrial Argentina.¹⁵ The *Quien es Quien* (Who's Who) of 1939 also furnished information on social club and business memberships.¹⁶ By identifying which clubs and organizations company directors belonged to, we gain a picture of their

¹¹ Wilson Suzigan, *Indústria brasileira: Origem e desenvolvimento* (São Paulo, 1986).

¹² Deutschland, Kaiserliches Statistisches Amte (after 1919, Statistisches Reichsamte), *Statistik des Deutschen Reichs: Auswartiger Handel des Deutschen* (Berlin, 1890–1904, 1906–1913, 1923–1929); Direction Générale des Douanes, *Tableau Général du Commerce et de la Navigation: Commerce de la France Avec ses Colonies et les Puissances Etrangères*, vol. 1 (Paris, 1897–1905, 1907–14, 1921–22, 1926–28).

¹³ The index came from Charles Feinstein, *Statistical Tables of National Income, Expenditure, and Output of the U.K., 1855–1965* (Cambridge, 1972), T136–T138.

¹⁴ The ten sectors are textiles, metallurgy, paper, matches, cement, glass, brewing, tobacco, soap and candles, and burlap sacks. Information for this data set of 1,282 directors comes from a variety of primary and secondary sources. All fifty-nine companies under study were public corporations whose records were available in business and finance journals of the time. The most important of these records were company bylaws, directors' and stockholder reports, and financial statements, and they are available in three publications: *Monitor de sociedades anónimas*; *Boletín oficial de la bolsa de comercio de Buenos Aires*; and *Boletín oficial de la República Argentina*.

¹⁵ "Bolsa de comercio de Buenos Aires: Historia de la jurisdicción y prácticas comerciales desde la época del Virreynato," donated by Luis Colombo to Biblioteca Nacional, 1935; British Chamber of Commerce in the Argentine Republic (Incorporated), annual reports for the years 1920–30.

¹⁶ *Quien es quien en la Argentina: Biografías contemporáneas* (Buenos Aires, 1939).

network circles. Directors relied on their networks to obtain capital and information, expand wealth, and increase their influence in business and industry. Because these networks reveal a high level of corporate interlocking, they represent a short list of the most reputable and influential contemporary Argentine businessmen.

Investment in Imported Machinery

Economic Cycles and Sources of Finance. In the early twentieth century, Argentina was closely tied to international markets and relied on foreign investment and trade for its economic growth.¹⁷ But its business cycles were volatile. Between 1900 and 1913, Argentina was one of the fastest-growing countries in the world: only the United States performed better in terms of total GDP growth.¹⁸ The export of agricultural goods, meat, and leather laid the foundation for the country's rapid economic expansion. Between 1895 and 1913, capital productivity also increased because entrepreneurs invested in industrial plants, meat-packing plants, sugar refineries, and mills.¹⁹ But these promising developments were interrupted by the economic downturn that accompanied the outbreak of World War I.²⁰ Economic historian Alan Taylor argues that, after 1914, Argentina lacked the savings capital it needed to substitute for the shortfall caused by the withdrawal of foreign investment.²¹

Between 1919 and 1929, the Argentine economy recovered, largely because of investment in capital goods. Economist J. Bradford DeLong found that economic growth in six leading nations was closely associated with investment in machinery over the long run (1870–1980).²² He suggests that, before 1930, Argentina's growth was linked to investment in machinery, and that its long-term economic stagnation in the mid-twentieth century was largely due to the sharp decline in the country's

¹⁷ Foreign investment represented nearly 50 percent of GDP. Taylor, "Capital Accumulation." See also Norma Lanciotti, "Foreign Investments in Electric Utilities: A Comparative Analysis of Belgian and American Companies in Argentina, 1890–1960," *Business History Review* 82 (Autumn 2008): 503–28.

¹⁸ Hofman, *Economic Development*, 31.

¹⁹ Roberto Cortés Conde, "The Vicissitudes of an Exporting Economy: Argentina (1875–1930)," in *An Economic History of Twentieth-Century Latin America*, vol. 1: *The Export Age, The Latin American Economies in the Late Nineteenth and Early Twentieth Centuries*, ed. Enrique Cárdenas, José Antonio Ocampo, and Rosemary Thorp (New York, 2000), 265–98.

²⁰ The year 1913 was a "crisis year in nearly all Latin American countries except Colombia and Venezuela." These two countries were not as dependent on foreign investment and international markets for economic growth. Hofman, *Economic Development*, 43.

²¹ Alan M. Taylor, "External Dependence, Demographic Burdens, and Argentine Economic Decline after the Belle Époque," *Journal of Economic History* 52 (Dec. 1992): 907–36.

²² J. Bradford DeLong, "Productivity Growth and Machinery Investment: A Long-Run Look, 1870–1980," *Journal of Economic History* 52, no. 2 (1992): 307–24.

imports of capital goods for investment.²³ Other scholars also found a strong correlation between capital-goods investment and economic growth in Argentina.²⁴ Guido Di Tella and Manuel Zymelman, for instance, first attributed the country's rising prosperity during the 1920s to its investment in imported and innovative capital-intensive methods. Recent scholarship has supported that view.²⁵

What were the sources of capital for investment in machinery? Banks provided some financing for manufacturing, but they imposed restrictive lending practices. For the most part, financial markets were not equipped for long-term lending, and capital shortages limited the size of manufacturing. The problem with Argentina's banking system was not a lack of capital but, rather, the banks' preference for retaining deposits.²⁶

When they were unable to obtain enough capital from the banks for long-term projects, entrepreneurs turned to other sources. In the early twentieth century, some entrepreneurs formed business groups to raise the capital they needed to invest in imported machinery. Some groups raised funds through their own banks and finance houses. They invested in agriculture, banking, hotels, entertainment, real estate, the fishing industry, and manufacturing, and then used the profits to invest in new activities.

In addition to raising capital, these groups formed networks with other groups and foreign agents. In Latin America, these networks were a predominant arrangement in the business community, which relied on them to advance their enterprises.²⁷ The networks reduced information asymmetries and transaction costs by enabling members to share

²³ He uses Díaz Alejandro's argument that investment in capital goods became a low priority under President Juan Perón DeLong. See "Productivity Growth," 318–19.

²⁴ Dorfman, *Economic Development*; Carl Solberg, "Tariffs and Politics in Argentina, 1916–30," *Hispanic American Historical Review* 53, no. 2 (1973): 260–84; Carlos Díaz Alejandro, *Essays on the Economic History of the Argentine Republic* (New Haven, 1970); Donna Guy, "Carlos Pellegrini and the Politics of Early Argentine Industrialization, 1873–1906," *Journal of Latin American Studies* 2, no. 1 (1979): 123–44; Jorge Schvarzer, *La industria que supimos conseguir: Una historia político-social de la industria argentina* (Buenos Aires, 1996); Carl Solberg, *Oil and Nationalism: A History* (Palo Alto, Calif., 1979).

²⁵ Guido Di Tella and Manuel Zymelman, *Los ciclos económicos argentinos* (Buenos Aires, 1973), 170–71; Isabel Sanz-Villarroya, "Economic Cycles in Argentina: 1875–1990," *Journal of Latin American Studies* 38, no. 3 (2006): 549–70.

²⁶ Regalsky, "La evolución"; Charles Jones, "The Transfer of Banking Techniques from Britain to Argentina, 1862–1914," *Revue Internationale d'histoire de la banque* (1983): 252–64; Fernando Rocchi, *Chimneys in the Desert: Industrialization in Argentina during the Export Boom Years, 1870–1930* (Palo Alto, Calif., 2006), ch. 6.

²⁷ Carlos Dávila and Rory Miller, eds., *Business History in Latin America: The Experience of Seven Countries* (Liverpool, 1999); Larissa Adler Lomnitz and Marisol Perez-Lizaur, *A Mexican Elite Family, 1820–1980: Kinship, Class, and Culture* (Princeton, 1987).

information.²⁸ During periods of economic uncertainty, networks were a valued source of reliable information about external conditions.²⁹ In this way, they helped groups to stay informed about their legal and business environment and to predict contingencies and economic downturns.

Investment in Machinery: Troughs and Peaks. Business groups used the information they gleaned from their sources to make timely investment decisions. Investment in capital-intensive production methods—specifically, machinery imported from England, Germany, France, and the United States—was motivated by several factors: the stages of international business cycles, relations with foreign distributors, and national economic policy. Practical matters were also considered, such as demand, costs, and access to ports and markets. The evolution of investment decisions grew in parallel with the changing political and economic climate of Argentina.

Business groups were willing to assume some financial risk in order to purchase up-to-date manufacturing machinery, but they were prudent investors. Typically, they put their money into areas with which they were familiar or that they expected would provide a high return. Between 1890 and 1930, Argentina spent more than 180 million real pounds sterling (adjusted for inflation) on machinery, largely in two sectors: 38 percent went to agricultural machinery, implements, and their components; and 34 percent went to industrial machinery (Table 1). These results coincide with findings that showed agriculture to be the most important sector in the economy, followed by industry.³⁰

While the category “industrial machinery” tells us little about which machines were imported, company reports indicate that investments were made in machines that enabled the firms to replicate popular imported items. Business groups did not introduce entirely new products to Argentine markets. Instead, their goal was to replace imports, as creating new products for internal markets would have been risky and costly.

Argentina’s transition from labor- to capital-intensive production methods in the late nineteenth century contributed to an average annual

²⁸ María Inés Barbero, “Mercados, redes sociales y estrategias empresariales en los orígenes de los grupos económicos: De la Compañía de Fósforos al Grupo Fabril (1880–1929),” *Estudios Migratorios Latinoamericanos* 15, no. 44 (2000): 119–45, 123.

²⁹ Mark Casson, “Institutional Economics and Business History: A Way Forward?” in *Institutions and the Evolution of Modern Business*, ed. Mark Casson and Mary B. Rose (London, 1998), 151–71.

³⁰ Roberto Cortés Conde, *La economía argentina en el largo plazo: Ensayos de historia económica de los siglos XIX y XX* (Buenos Aires, 1997), 230–31; Rocchi, *Chimneys*; Roy Hora, “La política económica del proteccionismo en Argentina, 1870–1914,” paper presented at the 14th International Economic History Congress, Helsinki, Finland, August 2006.

Table 1
Argentine Investment in Manufacturing Machinery, 1890–1930^a

<i>Industry</i>	1890	1895	1900	1905	1910	1915	1920	1925	1930
Industrial machinery, not specified	406,468	217,212	474,501	1,856,597	2,187,603	1,070,733	3,960,148	2,338,701	1,812,616
Agricultural machinery, implements, and components	197,431	163,147	373,035	893,619	1,165,775	445,826	4,172,564	4,205,121	3,995,596
Steam engines and machinery ^b	677,439	148,756	227,491	20,475	104,605	31,732	1,635,090	773,782	124,729
Electrical machinery for industry	—	—	50,312	30,488	47,705	58,187	1,393,138	652,334	790,925
Metal-making and working	—	427	—	—	88,176	6,567	365,548	369,416	73,187
Woodworking machinery	28,871	22,957	61,720	103,659	210,593	1,345	63,633	11,872	3,984
Textile machinery	12,275	8,689	37,110	90,183	116,648	34,752	667,839	568,749	108,370
Papermaking machinery	—	—	996	—	3,230	1,747	44,028	—	332
Sugar machinery	—	—	—	—	53,036	1,541	643,057	24,354	24,466
Brewery machinery	—	—	759	—	15,845	52,899	108,204	54,729	74,231
Cement-making machinery	—	—	—	—	—	—	33,396	90,948	118,637
Implements, tools, belts, replacement and spare parts,	—	—	—	—	—	—	—	—	—
Total for all machinery and parts	1,322,484	591,620	1,282,824	3,100,441	4,169,605	1,790,533	14,116,130	9,376,777	7,307,311
Fuel: cinder, coal, coke, petroleum (gasoline after 1924)	—	440,274	742,030	1,083,518	1,995,774	1,984,667	2,865,860	5,953,814	3,084,727

Sources: *Statistik des Deutschen Reichs, Auswärtiger Handel des Deutschen Reichs* (Berlin, 1890–1904, 1906–13, 1923–29); in Germany, export trade statistics were not separated by country between 1914 and 1922, and 1930. Direction Générale des Douanes, *Tableau Général du Commerce et de la Navigation: Commerce de la France Avec ses Colonies et les Puissances Etrangères*, vol. 1 (Paris, 1897–1905, 1907–14, 1921–22, 1926–28); U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, *The Foreign Commerce and Navigation of the United States* (Washington, D.C., 1890–1930). *Annual Statement of the Trade of the United Kingdom with Foreign Countries and British Colonies* (London, 1893–1930); *The Economist: Monthly Trade Supplement, Accounts Relating to Trade and Navigation in the United Kingdom of 1890* (Jan. 10, 1891); 27. Capital goods price index (plant and machinery) for British pound from C. H. Feinstein, *Statistical Tables of National Income, Expenditure, and Output of the U.K., 1855–1965* (Cambridge, U.K., 1972), T136–T138.

^a Real British pounds, 1913.

^b Except for locomotives.

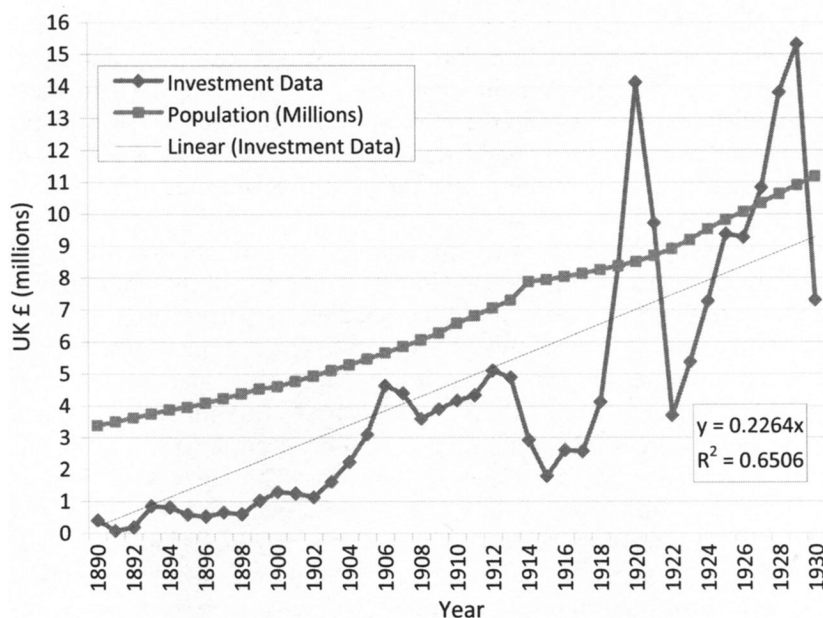


Figure 1. Argentine investment in manufacturing machinery, 1890–1930 (in real British pounds).

industrial growth rate of 6 percent between 1890 and 1930.³¹ Estimates of Argentine investment in machinery show annual amounts being channeled into thirteen categories (see Table 1). Figure 1 traces a linear trend of consistent investment growth. Entrepreneurs purchased and imported a mix of used and new machinery, equipment, replacement parts, and belts. From 1890 to 1930, the average rate of growth in machine investment was 4 percent per year; the average growth rate per capita was 4 percent. In the top two sectors, investment in industrial machinery increased, on average, by 4 percent per year, and the average growth of investment in agricultural machinery was 8 percent annually between 1890 and 1930.

International economic conditions, industrial policy, and internal consumption influenced the timing and volume of investment in manufacturing machinery. Figure 1 shows that the annual amount spent on imported machinery correlates with Argentina's business cycles and subcycles, which have been documented in the literature. Isabel Sanz-Villarroya confirms that "exports and investment were the explanatory

³¹ Calculated using adjusted values of industrial product. See Cortés Conde, *La economía argentina*, 230–31.

variables behind all the cycles before 1932, given that they show the highest levels of correlation with GDP [gross domestic product].”³² These two factors, “investment and exports, in that order, were the most unpredictable variables and therefore the potential causes of the fluctuations in GDP level.”³³ Exports were highly correlated with GDP from 1881 to 1918, and investment “establishe[d] relevance during the next cycle, 1919–1932.”³⁴

Observing short-term cycles is also a useful way to determine the reasons for investment. During the 1890s, investment in imported machinery reached its lowest point, largely because, from 1893 to 1902, Argentina was in a recessive phase: the average annual growth rate slowed, dropping to 3 percent, compared with the 6 percent rate that prevailed in the previous decade (1881–92).³⁵ Investment decreased, and machine investment fell by 23 percent between 1890 and 1899. Little investment occurred in either 1891 or 1892. This lag was followed by a slow, transitory rebound in machine investment between 1893 and 1899. From 1892 to 1902, the country recovered from its banking crisis, enabling it to focus on exporting agricultural and pastoral products. The government reestablished investor confidence by passing new commercial, tariff, and banking laws in order to prevent another economic crisis, to gain credibility among investors, and to encourage foreign investment. By 1899, the economy was on its way to recovery. That year, the government created the conversion office (*Caja de Conversión*) to stabilize the country’s currency. The *Caja* regulated banks and the national gold supplies in order to control Argentina’s international exchange rate.³⁶

By 1900, the economy had recovered, and, between 1900 and 1912, investment in machinery underwent its largest annual increase: investment in all imported machinery rose by 297 percent. The average annual growth rate was 12 percent: 8 percent per capita. Similarly, in Brazil, economist Wilson Suzigan found that machine investment peaked between 1902 and 1914.³⁷ During these years, investment in industrial machinery grew, on average, by 15 percent annually, while investment in agricultural machinery increased, on average, by 12 percent annually

³² Sanz-Villarroya, “Economic Cycles,” 562.

³³ *Ibid.*

³⁴ From 1919 to 1932, investment represented 16 percent of GDP, and “its correlation with GDP [was] 0.88, greater than that of any other variable.” *Ibid.*, 564.

³⁵ *Ibid.*, 562.

³⁶ The *Caja* fixed the rate of one British pound to 5.04 Argentine gold pesos. The paper peso was pegged to the Argentine gold peso at a rate of 2.27 (11.45 paper pesos was equivalent to one British pound). Argentina had a two-currency system. The paper peso was used for domestic trade, the gold peso for international trade.

³⁷ Suzigan, *Industria brasileira*.

Table 2
Percentage Growth Rates for Select Categories
from Table 1, 1890–1930

Industry	Years	% Growth Rate per Year
Industrial machinery, unspecified	1890–1915	4
	1900–1912	15
	1916–1930	4
	1890–1930	4
Agricultural machinery and components	1890–1915	4
	1900–1912	12
	1916–1930	10
	1890–1930	8

Sources: See Table 1.

(Table 2). In 1909, the industrial lobby, Unión Industrial Argentina (UIA), applauded the fast growth of investment in manufacturing machinery and tried to encourage the trend by campaigning for higher tariffs, in order to protect infant industries against “harmful competition from imported goods.”³⁸ Investment in agricultural machinery was driven both by strong international demand and by farmers’ desire to increase production through the acquisition of imported machinery.³⁹ Before 1914, however, beef cattle remained the most important commodity utilizing Argentina’s land.

The period between 1900 and World War I has been described as Argentina’s Belle Époque. These were the years when the economy expanded faster than at any other time; investment rates reached 15 to 20 percent per year.⁴⁰ Before World War I, the southern cone region, home to three of the four largest Latin American economies, Argentina, Brazil, and Chile, grew especially fast. Brazil and Argentina, in particular, became major consumers and importers of intermediate and capital goods.

Argentine investment in manufacturing machinery expanded for two other reasons. First, most of the business groups under study, such as Bemberg and Tornquist, started out as importers of manufactured goods.⁴¹ They were among the first to observe the growing consumer demand for imported items. A high birthrate and massive immigration

³⁸ “La industria argentina: Lo que dicen las cifras,” *Boletín de la Unión Industrial Argentina* 22 (15 Jan. 1909): 1–2.

³⁹ Jeremy Adelman, *Frontier Development: Land, Labour, and Capital on the Wheatlands of Argentina and Canada, 1890–1914* (Oxford, 1994), ch. 7.

⁴⁰ Taylor, “Capital Accumulation,” 181.

⁴¹ Taken from the database of 1,282 directors.

swelled the Argentine population, which more than doubled between 1890 and 1914. Figure 1 shows that the rate of population growth consistently exceeded the rate of manufacturing investment between 1890 and 1930. Annual imports of consumer goods increased. Business groups recognized that there was a potential advantage in substituting manufactured domestic products for imported consumer goods. They invested widely in various sectors of the economy, expanding and diversifying their portfolios to include manufacturing activities. Since the Argentine market was highly urbanized and concentrated in the federal capital of Buenos Aires and the littoral provinces, many businesses established factories nearby, in order to reduce costs.

A second reason for the increase in machine investment was Argentina's adoption of the gold standard.⁴² The Argentine government used its currency reserves to maintain a favorable exchange rate between the British pound and the peso. A stable domestic currency made it less expensive to import and install machinery from abroad, which came mostly from Britain, Germany, and the United States. Business groups and a few foreign financiers invested in the importation of foreign machinery. Direct foreign investment also increased, allowing domestic entrepreneurs to invest in domestic manufacturing, while foreign businessmen put money into Argentina's infrastructure (merchant shipping, railroads, hotels, roads, public transportation, utilities, and construction). The British put considerable resources into building an extensive rail network that connected outlying areas to Buenos Aires, and they facilitated the building of a national market for domestic goods.⁴³

Investment in imported machinery began to slow in 1913, and it declined further from 1914 to 1918. Between 1913 and 1915, there was a 63 percent decrease in machine investment, followed by a slow recovery. The onset of World War I limited foreign capital and disrupted trade. Companies cut back on their commercial activities, and firms experienced shortages of fuel and raw materials. Investment did not surpass the 1913 level until 1919.

This sluggish economic period was followed by an upturn, lasting from 1919 to 1929; during that decade, machine investment rose 83 percent. The average annual growth rate of this investment was 6 percent, and the average per capita growth rate was 4 percent over those ten years. Although this growth did not match the high rate that occurred between 1900 and 1912, the absolute amount spent on imported machinery at that time far exceeded any other period under study. Table 1 shows that investors imported nearly 115 million real pounds sterling

⁴² A. G. Ford, *The Gold Standard, 1880–1914: Britain and Argentina* (New York, 1983).

⁴³ By 1926, for example, Argentina's railroad network accounted for 43 percent of railroad track in South America. *Times Book on Argentina* (London, 1927), 4.

of machinery between 1919 and 1930, compared with little more than 66 million real pounds sterling spent between 1890 and 1918. From 1919 to 1930, the average annual growth rate of investment in industrial machinery was 4 percent, while agricultural machinery grew at an impressive 10 percent per year, leading all the other categories listed in Table 1.

In the 1920s, the sharp increase in machine investment occurred for different reasons than the ones that accounted for the trend that took place during the Belle Époque, when export receipts and foreign investment boosted economic growth. For one thing, the circumstances differed considerably. In the 1920s, Argentina went off the gold standard, experienced high labor and fuel costs, and experienced a slower rate of economic growth.⁴⁴

Four factors underlay the expanding machine investment during the 1920s. First, domestic demand for manufactured goods skyrocketed after World War I. In both Brazil and Argentina, for example, investment in capital goods accelerated in the mid-1920s, despite fluctuating economic conditions.⁴⁵ These two countries alone imported over half of the region's metal and electrical goods.⁴⁶ They also imported two-thirds of the cement brought into the region for infrastructure construction.⁴⁷ Domestic manufacturers invested more in machinery in order to produce more goods. In the cement industry, for example, domestic production of cement grew "as a result of expansion in demand, and not purely as a substitute for imports."⁴⁸

A second reason for the increased investment in machines was the unfavorable exchange rate between the peso and foreign currency, which initially drove up the prices of imported manufactured goods. In 1922, the Argentine government floated the peso. The resulting exchange rate, alongside increased tariffs, made imports more expensive to Argentine consumers. The exchange rate would have made most foreign machinery more expensive as well, but manufacturers counted on higher tariffs and prohibitive exchange rates to create favorable price conditions for import substitution.

When the peso began to appreciate after 1922, however, machinery became less expensive to import. At that time, manufacturers found exporters who sold similar competing products, which helped to reduce international prices for machinery. For instance, some U.S.-designed

⁴⁴ Sanz-Villarroya; Cortés Conde, *La economía argentina*; Díaz Alejandro, *Essays*.

⁴⁵ Suzigan, *Indústria brasileira*, 85–86.

⁴⁶ Argentina purchased and imported one-third and Brazil imported one-fifth of all metal and electrical goods. Tafunell and Carreras, "Capital Goods."

⁴⁷ Xavier Tafunell, "On the Origins of ISI: The Latin American Cement Industry, 1900–1930," *Journal of Latin American Studies* 39, no. 2 (May 2007): 299–329, 301–4.

⁴⁸ *Ibid.*, 322.

machinery and agricultural tools were also manufactured by German companies.⁴⁹ The United States and Germany had produced goods of similar quality and price since the late nineteenth century.⁵⁰ But, in the 1920s, Argentine manufacturers took advantage of the lower prices that prevailed during Germany's period of high inflation. Once the German mark was converted into real pounds sterling, German machine exports entered Argentina practically gratis.⁵¹

A third reason for increased investment coincided with the introduction of legislation more favorable to industry and brought greater government involvement in all economic activities. While the government had always played a role in the economy, it began to intervene more intensely in the 1920s.⁵² Political scientist Sergio Berensztein and legal historian Horacio Spector explain that the 1920s and 1930s marked a critical turning point, "as a series of institutional changes established the foundations of a state-centered economic and political system."⁵³ The government did not eagerly seek an active role. Rather, it was forced to intervene after 1914 by powerful interest groups from industry, agriculture, the military, and the interior provinces. Pressure to increase industrial tariffs, for instance, gained momentum with the onset of World War I, which brought material shortages and economic uncertainty.

Supporters of industry underscored the need for economic diversification and self-sufficiency. They argued that tariffs would provide the means to protect and develop domestic industry. Beginning in 1919, the Argentine Congress debated passage of bills to bring about a major increase to tariffs across the board, provide protection for selected domestic manufactured products, and allow duty-free imports of machinery, raw material, and fuel. By 1923, the government had increased the tariffs on imports of competitive manufactured goods to 50 percent

⁴⁹ Ralf Richter, "Technology and Knowledge Transfer in the Machine Tool Industry: The United States and Germany, 1870–1933," unpublished paper presented at the 2007 Economic and Business Historical Society Conference, Providence, Rhode Island, April 2007; Roberto Mazzoleni, "The Organization of U.S. Machine Tool Distribution in Europe (1890–1916)," *Industrial and Corporate Change* 11, no. 1 (2002): 53–84.

⁵⁰ Lincoln Hutchinson, *Report on Trade Conditions in Argentina, Paraguay, and Uruguay* (Washington, D.C., 1906), 44.

⁵¹ Industrialists welcomed machine exports, but the exports of consumer products competed with local products, causing the president of the industrial lobby, Unión Industrial Argentina, to call for strong antidumping laws that would slow or stop the entry of imported manufactured products. See "Defensa de la industria nacional (contra dumping)," *Diario de sesiones de la Cámara de Diputados* 4 (18 Sept. 1919): 815–18; "Proyecto reproducido: Dumping," *Diario de sesiones de la Cámara de Diputados, sesiones ordinarias* 4 (27 Sept. 1922): 649–651.

⁵² Hora, "La política económica."

⁵³ Sergio Berensztein and Horacio Spector, "Business, Government and Law," in *A New Economic History of Argentina*, ed. Gerardo della Paolera and Alan M. Taylor (Cambridge, U.K., 2003), 325.

(raised from 25 percent).⁵⁴ It increased tariffs on sugar, wine, and flour to protect agroindustries. The new customs law also permitted duty-free imports of capital goods, fuel, and raw materials.

The congressional debates created the impression that the government was working to produce a friendlier environment for manufacturing. Congress considered other bills that were intended to protect and promote the growth of domestic industry and its supplementary activities. For example, the legislators debated whether to award monetary prizes to metallurgy firms capable of processing one hundred tons of iron daily, and they considered whether to allow these firms to import machinery duty free.⁵⁵ A second bill proposed compelling the national mortgage bank, Banco Hipotecario Nacional, to offer mortgage loans with favorable terms to manufacturers seeking to expand production.⁵⁶ Several bills proposed expanding the petroleum industry, in order to guarantee fuel for industrial development.⁵⁷ By the 1920s, petroleum fuel had become a necessity, not only for manufacturing, but also for agriculture. Both sectors by then were capital intensive and mechanized, which helped to boost the nation's productivity.

A final reason for expanded investment, especially in agricultural machinery, was the major shift that had occurred in the country's international policy and trade relations. In the 1920s, the Argentine government changed its economic policy to reflect the new realities in international markets. As world wheat prices dropped steadily, Argentina responded by stepping up its own production. As a result, the wheat yield "rose 33 percent over the previous decade," largely due to improved technological methods.⁵⁸ In 1923, President Marcelo T. de Alvear appointed Tomás LeBretón as minister of agriculture, a post LeBretón occupied until 1925. LeBretón, who had been ambassador to the United States under the previous president, Hipólito Yrigoyen, had always been interested in promoting technology and innovation.⁵⁹ As agriculture

⁵⁴ Di Tella and Zymelman, *Los ciclos económicos*, 172–73. Law 11281 of 1923 raised tariff levels across the board for all finished consumer goods produced in the country. The rate varied according to product, ranging from 35 percent to 50 percent, but some products had specific duties on them, which led to an even higher rate.

⁵⁵ "Premios a la elaboración de hierro," in *Diario de sesiones de la Cámara de Diputados: Sesiones extraordinarias* 5 (8 Jan. 1919): 45–51.

⁵⁶ "Prestamos a establecimientos industriales," *Diario de sesiones de la Cámara de Diputados* 2 (4 July 1919): 682–83.

⁵⁷ The government's interest in the oil industry was to make fuel available for railroads, public utilities, the merchant marine, and domestic industry. "Proyecto de ley," in *Diario de sesiones, sesiones ordinarias* 4 (19 Aug. 1920): 285.

⁵⁸ Carl Solberg, *The Prairies and the Pampas: Agrarian Policy in Canada and Argentina, 1880–1930* (Stanford, Calif., 1987), 191.

⁵⁹ In the late nineteenth century, as a law student, LeBretón wrote his thesis on the topic of patents. In 1900, he established Argentina's longest-running magazine on patents, *Patentes y marcas: Revista Argentina de la propiedad intelectual e industrial*.

minister, then, it was not surprising that he “emphasized the technical and scientific aspects of agrarian development” and recruited Canadian and U.S. experts to help innovate Argentina’s agrarian sector.⁶⁰ In his position as minister, he also headed the patent office, where he eased the requirements for filing patents. Consequently, during the first half of the 1920s, the number of patents filed rose from a few hundred each year over the previous decade to more than two thousand in a single year (1923).

Meanwhile, Argentina’s trading relations with the United States improved. Before World War I, the United States had been the largest seller of agricultural machinery to Argentina, supplying around 67 percent of these goods between 1895 and 1904.⁶¹ As early as 1906, however, U.S. machine makers sought to fill more of the Argentine demand for industrial and agricultural machinery.⁶² In 1906, Lincoln Hutchinson, a special agent of the U.S. Department of Commerce and Labor, outlined the need for U.S. manufacturers to adapt machinery to local conditions and find ways to overcome Argentina’s “inferior banking, shipping, and credit facilities.”⁶³ During World War I, the U.S. Department of Commerce sent agents on fact-finding trade missions to Argentina.⁶⁴ Once these agents had confirmed the existence of markets for American machinery, U.S. producers began offering credit lines to Argentine manufacturers. U.S. machine makers and their distributors also quickly responded to requests by leading Argentine industrialists. For example, in 1924, the Boston firm Lockwood, Greene, and Company swiftly replied to Carlos Tornquist’s letter of inquiry about U.S. cotton-manufacturing machinery.⁶⁵

By the 1920s, U.S. machine manufacturers had replaced British and German firms as suppliers to Argentine companies. They offered inducements, such as long-term financing (up to ten years) and free shipping and repairs. U.S. machine makers replaced the British as Argentina’s main supplier. In 1920, one British trading agent lamented that the United States had overtaken his country, becoming the main furnisher of paper machinery to the Argentines. He noted that the United States had taken advantage of wartime conditions, “when deliveries from Great

⁶⁰ Solberg, *The Prairies and the Pampas*, 212.

⁶¹ Hutchinson, *Report on Trade Conditions*, 45.

⁶² *Ibid.*, 46.

⁶³ *Ibid.*

⁶⁴ J. A. Massel, “Markets for Machinery and Machine Tools in Argentina,” *Special Agent Series*, no. 116, Department of Commerce (Washington, D.C., 1916); Frank H. von Motz, “Markets for Agricultural Implements and Machinery in Argentina,” *Special Agent Series*, no. 125, Department of Commerce (Washington, D.C., 1916).

⁶⁵ “Lockwood, Greene, y Co., Inc. á Carlos A. Tornquist,” letter dated 13 Aug. 1924, available at Biblioteca Tornquist, Buenos Aires, file no. industrias 144-8271.

Britain and Germany became scarce and irregular and the United States had a clear field . . . [to branch] out into the paper business in Buenos Aires.”⁶⁶ U.S. manufacturers were also entering the Argentine market at a time when it was undergoing frequent mergers. Newly merged firms, such as the paper company Papelera Argentina (the result of a merger of six paper firms), wanted to buy the latest technology to replace the outdated machines of the companies they had purchased. (Some older firms had not updated their machinery since 1914.) U.S. machines were lighter and smaller, and thus easier to handle and ship, than British and European models.

Economist Sara Caputo found that the United States succeeded in international and Argentine markets because of its ability to satisfy the demands of developing nations for metal goods, automobiles, and agricultural and other light machinery.⁶⁷ In contrast, the British focused on exporting textiles, capital, and intermediate goods for textiles and railroads. Although U.S. and British exports “complemented rather than competed with each other,” beginning in the 1920s, Argentina became the “second most important buyer of [U.S.] agricultural machinery after Canada.”⁶⁸ However, this arrangement was not reciprocal, as the United States had stronger trading relations with Canada and Europe.

Entrepreneurship, Financing Innovation, and Policy

Despite the high level of investment in machinery, manufacturing and industry-related activities failed to advance economic growth in the long run. The lag in industrial growth, however, was not unique to Argentina. Scholars have settled on four major reasons for the relative underdevelopment of Latin American industry. First, the importing countries had higher setup costs because they had to import machines, which entailed the additional costs of shipping, handling, and hiring engineers to set them up.⁶⁹ Second, the high costs of establishing industrial factories were a barrier to entry, limiting the number of entrants.⁷⁰ Third, the labor forces of these countries were not as productive as workers in Europe and the United States. In Argentina, for example, the skilled labor required for large-scale, modern manufacturing was scarce. Histo-

⁶⁶ Department of Overseas Trade, *The Market for Paper and Paper Products in the Argentine Republic* (London, 1920), 11.

⁶⁷ Caputo, “La Argentina y la rivalidad commercial,” 602.

⁶⁸ *Ibid.*, 603, 601.

⁶⁹ Stephen H. Haber, *Industry and Underdevelopment: The Industrialization of Mexico, 1890–1940* (Stanford, Calif., 1989); Edward Beatty, *Institutions and Investment: The Political Basis of Industrialization in Mexico before 1911* (Stanford, Calif., 2001).

⁷⁰ Beatty, *Institutions and Investment*.

rian Jeremy Adelman argued that, before 1912, the workforce was made up largely of immigrants, who had little interest in developing skills or making long-term commitments that would tie them to Argentina.⁷¹ Most unskilled immigrant workers simply wanted to make money and return to their home countries. Skilled laborers who remained in Argentina preferred to become shop proprietors, rather than go to work for someone else.⁷² Finally, even the passage of more laws designed to protect and guide industrial development failed to establish a competitive, sustainable industrial sector.⁷³ Tariff policies were shortsighted, as they enabled large, established companies to gain more control over their respective industrial sectors.

In this section, I examine how the interplay between entrepreneurship, foreign machinery, and labor and tariff policy may explain why tariff protection gained momentum and eventually became the predominant policy by the mid-1920s. How did industrialists perceive the purpose of investment in imported machinery? What role did entrepreneurs play in industrial development? Did they develop the technological skills that would enable them to overcome problems with imported machinery? How did domestic labor and tariff policies affect industrial development?

In order to satisfy growing local demand, business groups invested in machinery so they could realize larger profits and increase production. Leaders of business groups perceived themselves as financing innovation when they bought new machinery and introduced factory methods that would speed up and improve production. They tended to invest in sectors and to acquire businesses with established markets. For example, before 1911, the Tornquist Group diversified its holdings through buyouts of existing manufacturers in Buenos Aires. Eventually, Tornquist owned several companies spanning a number of sectors: metallurgy firms (Talleres Metalúrgicos and Ferrum); a salt and import

⁷¹Adelman, *Frontier Development*; *Anuario Geográfico* indicates that, of all recorded immigrants entering the country between 1857 and 1930, only 53 percent remained in Argentina. *Anuario geográfico Argentina* (Buenos Aires, 1941), 186.

⁷²The censuses of 1895 and 1914 show that immigrants established thousands of manufacturing shops; they were strongly represented in industry and helped shape its structure. Luis Alberto Romero and Hilda Sabato, "Between Rise and Fall: Self-Employed Workers in Buenos Aires, 1850–1880," in *Essays in Argentine Labour History, 1870–1930*, ed. Jeremy Adelman (Oxford, 1990), 52–72; Cortés Conde and Oscar Cornblit discuss the substantial role played by immigrants in industry. See Roberto Cortés Conde, "Problemas del crecimiento industrial (1870–1914)," in Torcuato Di Tella, ed., *Argentina, sociedad de masas* (Buenos Aires, 1965), 59–83, 70; Oscar Cornblit, "Inmigrantes y empresarios en la política Argentina," *Desarrollo Económico* 6 (Jan.–Mar. 1967): 667–68.

⁷³Stephen Haber, "Political Economy of Industrialization," in *The Cambridge Economic History of Latin America: The Long Twentieth Century*, ed. Victor Bulmer-Thomas, John H. Coatsworth, and Roberto Cortés Conde (Cambridge, U.K., 2006), 537–84.

house (Introduktora de Buenos Aires); and a soap company (Conen).⁷⁴ The Tornquist Group, like other groups, used its capital resources to expand and improve its acquisitions, for example, by purchasing new technologies for its expanded manufacturing activities.⁷⁵

Investing in and learning how to operate imported machinery was a painstaking process. Research on the successful business groups shows that they relied on their finance and information networks when purchasing machinery and learning how to operate it. Once the information networks and financial connections had been established, the directors of the business groups worked to maintain and strengthen them, often sending their sons to foreign countries to study, to acquire additional knowledge, and to form business ties. For example, Ernest Tornquist, founder of the Tornquist Group, initially invested broadly, using funds from his financial house. Before his death in 1908, he sent his son Carlos Alfredo to the United States to be educated in banking and financing methods.⁷⁶ Upon succeeding his father as head of the group, Carlos Alfredo increased the group's networks, reputation, and wealth. Similarly, Otto Sebastián, head of the Bemberg group, sent his son Otto Eduardo to study industrial and brewery engineering at the Arcueil e Institut Tannenberg in France and at the Weihenstephan brewery in Germany.⁷⁷ Otto Eduardo expanded the group's Quilmes Brewery, acquired several other breweries, and diversified the firm's investment portfolio.

The business groups eventually ran into trouble with the imported machinery. They claimed that their firms were hobbled by the production costs associated with high prices of imported raw materials, shortages of fuel, and poorly trained workers. In 1927, for example, directors of the metallurgy company Cantábrica complained that iron shortages had raised their costs and inhibited their ability to produce efficiently. They also complained about the lack of inexpensive fuel sources.⁷⁸ Several manufacturers complained that they had to rely on international

⁷⁴Talleres Metalúrgicos began in the nineteenth century as T. M. Rezzonico; Ottonello y Cía. Ferrum began as O. Schnaith and Compañía and later became Ferrum, Industria Argentina de metales, sociedad anónima, beginning in 1898. In 1911, Tornquist turned Ferrum into a corporation. Introduktora began as Herman Schlieper y Cía, which started as an import house and later produced and sold cigarros toscanos (the brand names were Avanti, Regina, Tute), yerba mate, and salt. Conen, which produced soap, candles, glycerin, and related products, was incorporated in 1904. In that year, it had the capacity to produce nine thousand tons of soap per year.

⁷⁵*Ernesto Tornquist y Cía. Ltda. y sus compañías afiliadas: Breve Historia* (Buenos Aires, 1932); Jorge Gilbert, "Los negocios del holding Tornquist," in *Prosperidad y miseria. Contribuciones a la historia económica argentina*, ed. José Villarruel (Buenos Aires, 2004), ch. 4.

⁷⁶*Quien es Quien* (1939).

⁷⁷Database of 1,282 directors.

⁷⁸Iron and scrap-iron shortages were due to the absence of iron deposits in Argentina and to the export of scrap iron in the 1920s. "Cantábrica," memoria del directorio, *Boletín oficial de la bolsa de comercio de buenos aires* (10 Oct. 1927): 838–39.

supplies. The unexpected shortages and the higher prices they had to pay on the international market hurt production. Manufacturers also complained about inconsistent access to inputs, small domestic markets, and excessive competition from foreign sources.

Only a few Argentine manufacturers obtained the technical training they needed to overcome the problems associated with foreign machinery. Argentine manufacturers were not leaders when it came to advancing technical capabilities. Industrial progress depends on having an agenda of innovation and on continuing to accumulate technological knowledge.⁷⁹ Once the machinery has been acquired, the manufacturer has to “build technological capabilities through learning processes.”⁸⁰

Argentine businessmen’s failure to expand their technological capabilities stemmed from their business practices. Most groups did not seek to establish informal networks for the purpose of expanding technological knowledge, in part because of the amount of time that would have been required to establish and maintain them.⁸¹ A skillful leader had to be able to “engineer a culture specifically adapted to the industry and social environment in which his firm operate[d].”⁸² The technological strategy that the Argentine leaders adopted was simply to use their extant networks for information and finance. Their group members probably preferred their directors to spend time establishing more finance networks, rather than building technological knowledge.

The problems that Argentine entrepreneurs encountered with imported machinery were not unique to them—they occurred in nearly all newly industrializing nations. Most developing nations began by importing foreign machinery. But successful nations acquired the technological capabilities they needed: they adapted to local conditions, including familiarizing themselves with different types of energy fuel to overcome shortages.⁸³ Newly industrializing nations often enlisted support from the government, which fashioned appropriate economic policies to encourage technology development.⁸⁴

⁷⁹ Martin Bell and Keith Pavitt, “Technological Accumulation and Industrial Growth: Contrasts between Developed and Developing Countries,” *Industrial and Corporate Change* 2, no. 2 (1993): 157–210.

⁸⁰ “The ultimate achievement is to be a technologically mature firm with the ability to identify a scope for efficient specialization, to extend and deepen these with experience and effort, and to draw selectively on others to complement its own capabilities.” Gabriela Dutrénit, “Building Technological Capabilities in Latecomer Firms: A Review Essay,” *Science, Technology, and Society* 9, no. 2 (2004): 212–13.

⁸¹ María Inés Bárbero, “Treinta años de estudios sobre la historia de empresas en la Argentina,” *Ciclos* 5, no. 8 (1995).

⁸² Casson, “Entrepreneurship and Business Culture,” 43.

⁸³ Dahlman, Ross-Larson, and Westphal, “Managing Technological Development,” 759–75.

⁸⁴ Hofman, *Economic Development*; Dahlman, Ross-Larson, and Westphal, “Managing

The types of policies, however, differed radically across both countries and time. In Korea in the 1950s, for example, the government cooperated with business groups to promote effective industrial policies. As a result, Korea successfully industrialized through production, investment, and innovation capabilities.⁸⁵ In Argentina, in the 1920s, while leading business groups introduced new technologies, they did not lobby for policies to promote technological innovation and expansion. Economist Jorge Schvarzer argues that large-scale industrialists limited their demands on Congress, partly because they were trying to create a consensus among diverse factions within the Unión Industrial Argentina.⁸⁶ The UIA had been the main proponent of higher tariff rates since the late nineteenth century. Although the protectionist agenda remained consistent over time, its membership was quite diverse. In order to remain unified, UIA members agreed on two themes to debate before Congress: tariffs and labor.⁸⁷ Of the various bills affecting their interests that they presented to lawmakers, the UIA fought hardest for higher tariff rates.

By 1931, passionate pleas by UIA president Luis Colombo for a “rational protection program, if we do not seek to remain in the rear of even the most backward countries,” had become commonplace. Explicitly, the goal of the tariff was to promote infant industries by protecting them against competition from imported goods.⁸⁸ Hiking tariff rates was acceptable to most political players, because a rate change did not represent a radical departure from existing policies. Also, given the numerous revisions to the tariff over time, perhaps it offered the most flexible policy, as different groups could debate and compromise on rates in exchange for other favors.

Certainly, manufacturers stood to profit from higher tariffs. But some of the more successful business groups could have profitably

Technological Development”; Helen Shapiro and Lance Taylor, “The State and Industrial Strategy,” *World Development* 18, no. 6 (1990): 861–78.

⁸⁵ Linsu Kim, *Imitation to Innovation: The Dynamics of Korea's Technological Learning* (Boston, 1997), 5.

⁸⁶ Schvarzer, *Empresarios*, 50.

⁸⁷ The labor issue was important because Congress was passing a number of labor laws to protect women and children, reduce labor hours per week, set minimum wages, and create pension funds. Manufacturers alleged that these laws lowered labor's productivity and would result in inefficient production. Schvarzer, *Empresarios*, 50.

⁸⁸ Luis Colombo, “El Problema Actual,” speech given at the Rotary Club, 9 Feb. 1931. Printed in *Boletín de la Unión Industrial Argentina* 44 (Feb. 1931): 27. Both the primary and secondary literature can be used to assess the outcome of the tariff debate. See Díaz Alejandro, “The Argentine Tariff, 1906–1940”; Dorfman *Historia de la industria argentina*; Ferrer, *La economía argentina*; Schvarzer, *Empresarios*, 31–32; Solberg, “The Tariff and Politics in Argentina”; Coatsworth and Williamson, “Always Protectionist?” 205–32; Lewis, “Immigrant Entrepreneurs,” 99–100; Hora, “La política económica del proteccionismo”; Rocchi, *Chimneys*, ch. 7.

operated their large-scale factories without such support. Owners of these factories had another motive for supporting high tariff rates: they wanted the UIA to present petitions in Congress, urging lawmakers to pass laws designed to pacify labor in order to prevent disruption of factory life and production. By the 1920s, large-scale manufacturers, who might have employed hundreds of workers, were complaining to the government that poorly trained workers were slowing production and breaking expensive machinery. With the surge of large-scale immigration that began in 1900, employers and legislators began debating a series of laws regarding the education and training of factory and rural workers. Owners were concerned about the rising numbers of strikes in the industrial zones, and they were caught off guard by the unexpected passage of bills that reduced daily and weekly work hours. In the 1920s, the government became more protective of industrial laborers, seeking to shield them from abusive working conditions and to help them prepare for factory and agricultural work. For example, it funded several schools in urban areas to train working-class women, girls, and young men for work in factories. These groups were considered to be the ones equipped with the fewest skills, and thus were seen as potentially the easiest to control.⁸⁹ In 1924, the government passed gender-based labor laws to protect women and minors. In the 1920s, women joined the workforce in increasing numbers. The 1935 industrial census reveals that women made up over half of the workforce in textile-related activities, one-third of the workers in the paper industry, and close to a third of the workers in metallurgy firms. The new laws curtailed women's ability to operate machines and to work at night. In 1924, the UIA argued against the gender-based laws, claiming that the number of mandatory breaks for working mothers disrupted the "order and routine" of the factory schedule. Manufacturers opposed legislation introducing employer-paid pensions, the eight-hour work day, and mandatory Sunday breaks.⁹⁰ Although labor legislation benefiting workers was long overdue, according to the manufacturers the changes increased labor costs and potentially disrupted the work day.

The introduction of a higher tariff rate, which boosted profits, was a compromise, designed to pacify owners' dissatisfaction with labor costs and other problems. But Argentina's tariff policy hindered industrial

⁸⁹ Antonio Sagarna, "Comisión asesora de la enseñanza industrial," and Luis Colombo, "Las escuelas industriales del Colegio Pio IX," *Boletín de la Unión Industrial Argentina* 41 (Jan. 1928): 845–48; "Enseñanza industrial," *Boletín de la Unión Industrial Argentina* 41 (Feb. 1928): 893–94.

⁹⁰ Law 11544 of 1929, for example, limited the work day to eight hours per day and forty-eight hours per week. Law 11837 of 1934 mandated that all commercial and most industrial enterprises close by 8 PM.

development in two ways. First, it reduced the incentive for manufacturers to expand their technological capabilities through innovation. In developing nations, leading entrepreneurs were perhaps the best equipped to expand and innovate technology.⁹¹ But in a protected environment, entrepreneurs could earn profits, regardless of whether they were investing in the expansion of technological knowledge. In the long run, tariff protection also limited the producers' international competitiveness, as it restricted them from selling anywhere but in the domestic markets.

Second, tariff legislation was a political, not an economic, solution to industry. Decisions to raise tariffs did not evolve out of a long-standing dialogue about multiple options for promoting industry. Instead, Congress raised tariffs because this was the best political compromise and entailed a less cumbersome process than committing to a long-term industrialization plan. Economic historian Stephen Haber argues that most Latin American industrial policies were not import substitution but were, rather, compromises among different political players.⁹² By 1923, the increase to tariff rates had established a precedent, leading to a consensus among policymakers that more protection, rather than measures to increase efficiency, was the best way for government to aid industry. Protectionism became a panacea that overrode other potential government-based solutions, as it yielded results in the short run and represented policy that had been accepted since the nineteenth century.

Conclusion

Between 1890 and 1930, business groups advanced the modernization, productivity, and growth of Argentina's manufacturing and agricultural sector through their investment in imported machinery. When economic conditions underwent an upswing from 1900 to 1912, business groups invested in manufacturing and agriculture because these two sectors were expected to do well over the long term. Before 1912, policy decisions stood in the way of investment in machinery. Domestic investors sought to diversify their portfolios and expand production. Some group leaders were also optimistic about Argentina's long-run economic prospects. For instance, in 1919, Carlos Tornquist wrote that he believed Argentina's "development in the last fifty years demonstrate[d] that its soil, its race, its ideals, its social, political and economic

⁹¹ Mark Granovetter, "Coase Revisited: Business Groups in the Modern Economy," *Industrial and Corporate Change* 4, no. 1 (1995): 93–130.

⁹² Haber, "Political Economy of Industrialization."

organization [would] make it, within a few years, one of the most powerful nations of the Earth."⁹³

Argentina's level of investment in machinery was indeed impressive, but the effort did not lead to sustained economic growth. Both internal and external factors affected the outcome. Manufacturers encountered several obstacles to production, including shortages of basic inputs, lack of machine adaptation, and labor problems. Advances in technological capabilities were neglected in favor of building finance networks. In the agricultural sector, imported machinery spurred productivity, but international prices for wheat and cattle declined in the 1920s and continued to fall through the Great Depression. While Argentine farmers produced more, they also helped to drive down international prices by contributing to the glut in the global markets.⁹⁴

By the 1920s, Argentina's political and economic landscape had changed considerably since the Belle Époque. The economy grew more slowly, and the passage of new labor laws and global competition for Argentina's agricultural products brought uncertainty. Several factions supported industry in order to reduce the country's dependence on imported products and diversify the economy. However, the compromise strategy of imposing higher tariffs to deal with labor and factory expenses stifled the drive to innovate that was necessary for the achievement of more lasting economic growth and industrial development.

⁹³Ernesto Tornquist y Co., Ltda., *Economic Development of the Argentine Republic in the Last Fifty Years* (Buenos Aires, 1919), xvii.

⁹⁴Adelman, *Frontier Development*; Solberg, *The Prairies and the Pampas*.