

Management as an Entrepreneurial Activity: The Internationalization of the Argentine Company Siderca (1960–1996)

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Abstract

This paper analyzes and explains the process of internationalization of an Argentine company that produces seamless pipes. Siderca initiated its activities during the import substitution phase in Argentina and later achieved international market leadership. The explanation for this breakthrough onto the global stage is to be found in the arrival of a new and young group of middle managers who were promoted from within the corporation. This pattern is consistent with the literature on the role of middle management in the design and implementation of strategic change. The transformations in this company also influenced the rest of the activities of the Techint Group.

Keywords: Argentina, internationalization, iron and steel industry, middle management, Siderca, Techint Group

Acronyms used

Aesial	Study Area on Argentine and Latin American Industry (Área de Estudios sobre la Industria Argentina y Latinoamericana)
BIRA	Banco Industrial de la República Argentina

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EG	Economic Groups
FLACSO	Latin American Social Sciences Faculty (Facultad Latinoamericana de Ciencias Sociales)
LACO	Continuous roller
MM	Middle Managers/Middle Management
Safta	Sociedad Argentina Fabricante de Tubos de Acero
SAIC	Industrial and Commercial Limited Company
SF	Strategy Formation
TG	Techint Group
YPF	Yacimientos Petrolíferos Fiscales

INTRODUCTION

Argentine state-led efforts to achieve energy autarky go back to the periods of the 1920s and the 1940s, and while these were not the only such efforts, they do constitute two key landmarks. Without doubt, the first and best known was the creation of the company Yacimientos Petrolífero Fiscales (YPF) during the 1920s. The second was the establishment of the firm Gas del Estado in 1945 (Gadano 2006; Dachevsky 2013; Galé 2005; Castro 2010).

Hydrocarbon exploration and exploitation necessitated the use of a variety of supplies, including steel pipes for extraction and transportation. The political, ideological and economic conditions of Argentina during the post-war period prepared the ground for the installation of an industrial plant that could provide these.

These were the beginnings of the Dálmine-Safta project (later Siderca, the name used in this study) promoted in the 1950s by a group of Italian engineers led by Agostino Rocca, as part of what would subsequently become the Techint Group (TG).¹ Though this was a private undertaking, it had strong backing from the administration of Juan Domingo Perón in the form of loans issued by the Banco Industrial de la República Argentina (BIRA).² Another aspect that reflected its dependence on the state was that, initially, its only customers were public entities.

However, though Siderca was dependent on supplying pipes to YPF for many years, the company constantly strove to diversify its markets. The instability of the local economy and the petroleum crisis of 1973 prompted it to devote still greater efforts to penetration of international markets. By the 1980s, the firm was placing more pipes on the export market than it was selling domestically, and had established itself as one of Argentina's foremost exporters. In the following decade, the acquisition of companies in Mexico and Italy turned it into a world leader. According to Toulan (1997), it can be said that Siderca is one of the few cases to successfully prove the infant industry argument. It would be no exaggeration to state that Siderca is the most important and successful industrial company in Argentina's history.

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1. The TG was founded in Milan in November, 1945, and its founder moved to Argentina a few months later. Historically, its core businesses were steel production and the engineering of public and energy works. Later, it expanded into the energy and some services sectors. From early on, it had a multinational character, and today it is the biggest business group in Argentina. The size of its payroll totals 50,000 employees worldwide.
 2. For an analysis of BIRA's loans to TG firms see: Rougier (2001).

This objective of this paper is to chart the company's trajectory and explain its successful internationalization process between the 1970s and the 1990s, when it became the international market leader in seamless pipes.³

The firm's founders, a group of Italian engineers as noted above, had considerable experience in the steel industry of their native country, and this is key to understanding Siderca's commercial startup in Argentina. Moreover, the links between the founding group and Italian industry are worthy of consideration.⁴

Thus, multiple factors contribute to explaining the successful performance of Siderca. In this study, we emphasize the role played by a group of young managers, who emerged in the 1970s and turned an economic opportunity into the consolidation and formalization of an internationalization strategy. This will be shown to be consistent with the literature, which stresses the relevance of middle management in the design and implementation of strategic changes within a company.

To this end, first we will summarize studies that are directly or indirectly related the Siderca, then we will discuss some of the theoretical resources utilized for the analysis of the case discussed here. Then, we will dedicate most of this study to the description of the processes undergone by the company from its origins to the emergence of a new management group, which went on to lead the company to a successful internationalization and globalization process that entailed the investment of assets abroad between the 1980s and 1990s.

EXISTING STUDIES ON SIDERCA

FLACSO has been instrumental in establishing economic groups (EGs) as a topic of academic research in Argentina. In one study already considered a classic, Basualdo and Khavisse (2004 [1986]) analyze the role EGs during the 1970s and 1980s. From their perspective, EGs exploited transfers from the state using a range of channels, which gave them a hegemonic position in Argentine industry.⁵ In a complementary study, Basualdo and Azpiazu (1990)

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3. We define internationalization of a company as its capacity to sell and produce abroad. Globalization refers to coordinating and complementing production through plants located in different parts of the world. This latter phenomenon occurred at Siderca in the 1990s.
 4. On the founder of Techint and its Italian trajectory, see: Lussana (1996, 1999); Lussana and Tonolini (2005); Amatori (2005); Dellafoggia (2000); Setta (1993); Offeddu (2010). On the Italian Dálmine, a company run by Rocca and which later participated in the Argentine firm of the same name, see Amatori and Licini (2006).
 5. This concern for stressing the articulation of EGs with the state has resulted in the omission of the major corporate networks that these groups organized, both internally and with others, which allowed

analyze the development of local EGs in more detail. They contend that during the dictatorship of 1976-1983, EGs were able to subordinate various mechanisms of industrial promotion to their own interests and strategies. The authors cannot fail to acknowledge, however, that the transfer of revenues to private companies, just like in all other examples of late industrialization, was a broad-based and long-lasting phenomenon in Argentine economic history, and included a significant number of firms of varying sizes that were a long way from entering the international market.⁶ On the other hand, most steel pipe producers in the developing world – and also sometimes in the advanced world – enjoyed monopolistic positions locally. In a certain way, the very nature of the market demands as much. Situations similar to that of Siderca also applied to local companies in Mexico, Venezuela, Brazil, and Italy. Nonetheless, almost all of the cases cited were facing serious problems by the 1990s and were acquired by Siderca. How can this phenomenon be explained?

Beyond the academic preeminence of the FLACSO school of thought regarding the interpretation of Argentine EGs, there were authors who problematized this approach in a variety of ways. Without having devoted a study specifically to the TG, Schvarzer (1993) accepts that the promotion of large industrial projects in Argentina involved a transfer of revenues to the groups and/or firms that undertook them. However, he contends that: a) because of the number of basic inputs required by industrial projects, it was necessary for these to be promoted by the state; b) the logic of promotion does not seem to differ from the experience of other developing countries; c) these projects sought to achieve rather than alter import substitution; and d) balance of payment restrictions in the 1970s created a strong propensity to drive up the costs of such projects. On the other hand, there were many setbacks and changes during the 20-year implementation process, due to changes of governments and reorientations of macroeconomic strategy, as well as competition between different power constellations to appropriate these transfers. Thus, quite apart from the all-powerful image of local EGs that was projected, some of them, which had been well-positioned in the mid-1970s, endured sharp declines or disappeared altogether (Schvarzer 1993). The idea, then, of industrial promotion subordinated exclusively to the business strategy of a select group of large corporations is less in evidence here.

them to confront threats in an ever-unpredictable and changing economic environment (see Lluich *et al.* 2014; and on the TG's ethnic and family networks, see Castro 2013). We argue that though these relationships have been important, the technical links with the group's Italian firms are key in explaining the international leap taken in the 1970s. However, these companies played no more than a secondary role, given that in the 1970s and 1980s, the group's Argentine component was more important than its peninsular counterpart.

6. For example, a historical review of the different types of companies that received transfers from the state after the WWII – including Siderca itself – can be found in: Rougier (2001); Rougier and Brennan (2013); Rougier and Belini (2008).

Juan Kornblihtt (2008) authored one of the few specific pieces of research on Siderca. He attempts to explain the factors behind its successful transformation into an exporting company. One of the strong points of Kornblihtt's study, which also departs from FLACSO's stance, is a detailed analysis of the international pipe market - central to understanding the behavior of the Campana-based firm.⁷

Siderca's monopolistic relationship with YPF provided it with a market that, in the long-term, served as a platform for its international integration. Additional transfers received from the state through other channels were also influential, as were the tax exemptions and liquidation of liabilities. To accept Kornblihtt's premise is to accept that the exploratory and production activities of YPF and local private oil companies were sufficiently dynamic, regular, and foreseeable to give Siderca a market of considerable size through which it could accumulate and deploy production capacities. As we will see, the activities of oil companies, above all those of YFP, the largest producer, were a long way from possessing the abovementioned attributes. The "antibodies" that Siderca developed related to this situation were perhaps one of its strongest assets.

For another perspective, Alejandro Artopoulos's (2009) work stands out. Availing himself of the theories of authors such as Castells, Powell, and Nohria, on new forms of corporate organization in the age of globalization and information technology, this author analyzes the transformation of Siderca between 1976 and the 1990s. Through this process, Siderca ceased to be a traditional, steel-producing company on the periphery to become a multinational that not only competes successfully with companies from the advanced world, but is also capable of reinventing itself as a firm that is part of the knowledge-based society: a network company. Artopoulos's study takes a perspective that is more sociological than historical and places more emphasis on the transformation that the company underwent from the 1990s onward.

In addition, there are a series of valuable studies that touch upon the TG tangentially, but which, given their specific subject matter and periods covered, are beyond the scope of this study. This is the case of the work of Dossi (2011), which analyzes the role of the TG within the Argentine Industrial Union (Unión Industrial Argentina), and that of Gaggero (2011), which studies the behavior of local groups before the liberalization and privatization process of the 1990s.

7. Municipality in the Province of Buenos Aires where Siderca is located.

In sum, despite the varied and expanding literature on the TG, an explanation of the internationalization process of its most successful company that is not based exclusively on the reductionism of centering on its links with the state, is still a pending task.

SOME CONCEPTS ON ECONOMIC GROUPS AND MANAGEMENT

The formation of EGs, generally diversified in character, is a phenomenon that is characteristic of the economies of the emerging world. According to Leff (1978), this is explained by information shortfalls, underdeveloped capital development, excessive regulation, and a workforce lacking in technical and management capabilities.⁸ With respect to the labor factor, these groups respond to the paucity of trained workers by preparing their own managers and creating an internal labor market to which they have access when one of their own companies finds itself in a critical situation (Khanna and Palepu 1997).

Moreover, EGs possess another series of positive characteristics related to personnel. Alice Amsden (2008) argues that they offer a framework for making decisions quickly and directly, above all in monopolistic and oligopolistic markets. As in Japanese zaibatsu, the combination of dynamic and ambitious owners and professional managers poses a challenge to the bureaucratic structure inherent in the network of subsidiaries, regional offices, and head offices that characterize multinational companies from the developed world (Amsden 2008). In the case studied here, we will see not only the importance of the professionalization of Siderca's managers, but also their strong motivation and the extensive room for maneuver they possess for promoting the company's growth and international development.

In addition, we will complement this literature with that concerning the studies on the role of management in processes of change. We employ Mintzberg's (1978) concept of strategy, understood as a common pattern of action in a stream of decisions. The aim here is not only to underline its deliberate and explicit character, but also the fact that it is a decision-making process that is consistent over time, gradual, evolutionary, and at times unplanned. One of the interesting features of Mintzberg's seminal work is his questioning of the traditional dichotomy between the formulation and implementation of a business strategy, as this ignores the social learning that takes place within an organization following the design of a long-term plan. According to the author, the idea of "formulation" in relation to a business strategy is misleading and that is why he prefers – as the title of his article suggests – to use the concept of strategy formation (SF).

8. There is an extensive literature on the international level about the character of EGs from the emerging countries, see: Granovetter (2005); Guillén (2000); Guillén and García Canal (2005); Guillén and Kock (2001); Khanna and Palepu (1997).

Wooldridge *et al.* (2008) argue that the break from the aforementioned dichotomy opened up the strategic process to the influence of middle managers (MM, also middle management). From there, an abundant literature emerged that ascribed a central role to MM in SF through knowledge generation and the development of core competencies.⁹

Bower's study (1970) was one of the first to highlight the contribution of middle management to a more accurate assessment of the strategic course of a company. Subsequently, Wooldridge and Floyd (1992) demonstrated the positive correlation between the involvement of MMs in a company's strategy and its performance. Shortly afterwards, these authors made a supplementary technical contribution, identifying a typology of MMs' participation in the strategic dimension. There, they highlight four fundamental actions: on the one hand, two in which MMs exert an ascending influence in the firm, altering the viewpoint of senior management by first attempting to transform business opportunities through new strategic alternatives and, second, by managing the company's information, thereby influencing the perspective of superiors; on the other hand, two that entail descending influence, one of which renders the organization more flexible so as to assure conditions of change, and another that aligns the structure with the strategic objectives (Floyd and Wooldridge 1992).

Mair and Thurner (2008), for their part, ask why in a single company some MMs involve themselves more in the internationalization processes than others. Analyzing the case of a medium-sized Italian enterprise, they suggest - inconclusively - that those MMs with responsibility over company revenues get more involved. We will see that this hypothesis is consistent with the case analyzed here.¹⁰

SIDERCA: THE INTERNAL MARKET AND IMPORT SUBSTITUTION (1954-1976)

Techint was founded in Milan, Italy, in November 1945. The following year, its founder, the engineer Agostino Rocca, moved to Argentina and established Techint SAIC, an engineering and construction firm that quickly secured a position of prominence in the local market. In 1949, taking advantage of his contacts in Italy and his prior experience in that country's steel industry, Rocca decided to set up a company to produce pipes for hydrocarbon drilling,

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9. A middle manager is understood as being an individual in charge of a subunit of the company who executes "day-to-day" operations and articulates these with senior management. Given their role as lynchpins between vertically related groups, they exert both ascending and descending influence in an organization (Floyd and Wooldridge 1992: 154).
 10. The main primary source cited in this study is an individual who took part in the strategic reorientation of Siderca and who, not by coincidence, was in charge of the company's commercial area.

extraction, and transportation. The firm was originally called Dálmine-Safta (Sociedad Argentina Fabricante de Tubos de Acero), but at the start of the 1960s, following the merger with the Siderca steel company, its name was first changed to Dálmine-Siderca and then to Siderca¹¹.

As with many companies that emerged as a result of the import substitution process, the objective was to meet the demands of the internal market, replacing foreign production. The link-up with the state and, fundamentally, with the national petroleum producer, YPF, was a key element in the company's strategy. Following low-profile development over its first five years, there were two factors that seemed to converge in favor of the Campana-based company. First, Frondizi's petroleum plan considerably boosted the exploration and production activities of YPF, then Siderca's only customer. This ensured a predictable future and the exploitation of economies of scale.

Second, the prospects of the international pipe market looked promising. Between 1960 and 1980, as a consequence of the constant increase in hydrocarbon demand and production, the global pipe trade grew between 15% and 30% year to year. Though 90% of exports were concentrated in advanced countries, such as the UK, the U.S., Japan, Germany, France, Italy, and Sweden, the first two countries gradually looked toward their own internal markets and lost their gravitational pull in the international market by the 1970s. By the start of the following decade, between 60% and 70% of the market belonged to Japan, the world's largest exporter, and Germany (Kornblihtt 2008).

The increase in international demand gradually opened up space in the market for companies from countries on the periphery. Rocca believed that exports would be primarily destined for neighboring countries. However, most of the company's production was required to cover the local oil industry's expansion process. According to the firm's balance sheet, in June 1960, a new contract was signed between Siderca and YPF for the production of 115,000 tons of piping to be delivered in 20 months. Siderca reduced the basic price of its piping by 10%, and extended US\$20 million in financing. This financial undertaking was rewarded with the prospect of a long-term contract, an increase in scale, and planned production (Dálmine-Safta 1960).

11. For the origins of the TG and the career of Rocca in interwar Italy, see Castro (2003). For the beginnings of Dálmine-Safta and its development in the early years, see Castro (2010). Over time, the pipe production company became TG's main business, with revenues exceeding even its engineering activities. The firm assumed a leading position in the TG, especially when it is recalled that it did not even have a holding company until the 1980s. Dálmine-Safta was the majority shareholder of several of the firms in the conglomerate, as well as participating in the foundation of new companies and, at times, assisting them financially, as was the case of Propulsora Siderúrgica.

That same year, the bureaucratic barriers to importing steel and future expansion prospects persuaded the company's management to add an electrical steelworks to the plant in order to supply the raw material required for pipe production. Thus, in 1961, construction of the Siderca steelworks began and it came into operation in 1963.

The financial year of 1960–1961 was particularly optimistic, with production exceeding 103,000 tons – a figure that could not be surpassed for the rest of the decade. The plant began to fully utilize its rolling mills and the firm became accustomed to the scale of production.

However, the coup against president Frondizi in 1961 resulted in a short but acute economic crisis. The new administration, led by José Mariá Guido, applied a severe program of monetary orthodoxy and induced a strong devaluation, price increases, and deterioration in salaries. Industrial production fell by 5.5% in 1962, and 4% in 1963. Moreover, the devaluation dangerously expanded the indebtedness of firms that had obligations in foreign currency (Rougier and Belini 2008).

YPF was affected by the fiscal adjustment policy of the Argentine government. In 1962, its orders fell substantially, and in 1963, it did not receive a single purchase order. Left with overstock, it had no alternative but to shut down the plant for fifteen days in April 1963 (Dálmine-Safta 1963).

The fear and loss of confidence precipitated by Siderca's links with YPF, some of which predated this crisis, were voiced by the company's top management:

However, the Board recognizes the drawbacks of having a predominant customer such as YPF, a drawback foreseen in 1961 when the government imposed on the company a change in the industrial program that initially factored in a parallel production line of commercial pipes with the precise purpose of avoiding having just one customer.

[...]

To achieve market diversification, the company has erected facilities for cold drawing and the production of tubular posts, as referred to in the last report. We plan to continue with the program of continuing to expand the range of products that can be offered on the non-petroleum market.¹² (Dálmine-Safta 1963).

12. Translation by *Apuntes*.

When the Siderca steel plant was opened during the financial year 1963-1964, the commercial crisis in the petroleum sector was still deepening. Production was only half of what it was at the start of the decade, and exports totaled no more than 32,500 tons. Nonetheless, as previous fiscal years had shown, foreign sales were there to stay. And though these sales were not always made in entirely profitable conditions, they began to form an integral part of the commercial strategy: "The company proposes the allocation of around 25% to 35% of production to exportation, just like similar firms in more developed countries."¹³

The figures estimated by Rocca proved highly accurate (Table 1). As a result, though the company did not break away from its dependence on YPF, foreign sales and production for the industrial market allowed for its reduction. YPF's difficulties, along with the opportunities that had opened up in the export market, undoubtedly served as a lesson to the company's various managers. Though the core of the initial strategy - the internal market - had not changed radically, peripheral elements emerged that partly modified and complemented it.

Table 1
Siderca: pipe sales by line of business activity, 1963-1970 (in tons and percentages)

Accounting year	Local sale				Exportation		Total (tons)
	Petroleum use		Non-petroleum use		Tons	%	
	Tons	%	Tons	%			
1963-1964	-	-	13,872	34	32,500	66	46,372
1964-1965	35,659	42	24,052	29	24,515	29	84,226
1965-1966	54,280	54	27,807	28	18,018	18	100,105
1966-1967	55,452	62	21,615	24	12,071	14	89,138
1967-1968	40,781	40	28,005	28	32,316	32	101,102
1968-1969	34,237	29	41,457	35	43,872	36	119,566
1969-1970	37,257	27	54,606	40	45,080	33	136,943
Average	42,944	36.29	30,202	31.14	29,767	32.57	102,913

Source: Dálmine-Siderca (1963-1970); compiled by author.

13. Letter from chairman to shareholders (Dálmine-Siderca 1964). Translation by *Apuntes*.

New investments and expansions were made to mitigate against the erratic behavior of YPF. In 1965, Rocca had the following to say at the shareholders' meeting:

Nevertheless, to reduce the impact the company could experience as a result of the repetition of situations similar to those of the last two years, to create an additional stable market base, the company has decided upon and is implementing a program of highly important expansions to increase the production of high-quality pipes aimed at markets other than the oil industry, and to begin production of stainless and special rolled steel, which will require an investment of US\$12 million in the first stage, as set out in the Board Report.¹⁴

The new investments included a hot-rolling production line; installation of a rolling mill/reducer and stretcher; a line for finishing, threading, and testing pipes of 0.5 to two inches in diameter; a thermal treatment line for special steel pipes; and machinery for cold pipe and coupling production. This equipment entered into production in 1967. Resources were drawn from shareholder contributions and loans from financial institutions and providers such as the Export-Import Bank and the Inter-American Development Bank, underwritten by BIRA (Dálmine-Siderca 1967) (Table 2). As part of the steel diversification and quality improvement process, in 1968, a continuous casting machine was installed to enable the production of high carbon-content steel billet and special steel.

Table 2

Siderca: entities that financed the steelworks expansion, direct pipe reduction and rolling, 1974–1976 (in millions of dollars)

Emity	Amount
Ex-Im Bank, Bankers Trust, Bank of America and private banking groups	72.8
International Finance Corporation	14.0
European providers	7.7
Other loans in foreign currency	6.1
Loans in Argentine currency	1.4
Total	102.0

Source: Dálmine-Siderca (1976).

14. Verbal report of the chairman to the Dálmine-Siderca shareholders during the general meeting of August 12, 1965 (Dálmine-Siderca 1965). Translation by *Apuntes*.

Though YPF remained an important customer, its relative importance diminished. By the end of the 1960s, Siderca was able to offer a range of pipes to the Argentine industrial and petroleum market as well as producing for export. In the following decade, this led to two sales and production records, in 1972-1973 and 1973-1974 (Table 3).

Table 3
Siderca: pipe sales by line of business activity, 1970 - 1976 (in tons and percentages)

Financial year	Local sale				Exportation		Total (tons)
	Petroleum use		Non-petroleum use		Tons	%	
	Tons	%	Tons	%			
1970-1971	40,123	30	48,627	37	43,061	33	131,811
1971-1972	68,061	45	49,784	33	32,237	22	150,082
1972-1973	55,781	36	54,556	35	43,864	29	154,201
1973-1974	54,682	38	45,863	31	45,584	31	146,129
1974-1975	66,550	45	46,397	31	34,952	24	147,899
1975-1976	78,540	58	42,198	31	14,822	11	135,560
Average 1969-1976	60,623	42	47,904	33	35,753	25	144,280

Source: Dálmine-Siderca (1976); compiled by author.

Exports accounted for an average of 25% of sales between 1969 and 1976, which was not inconsiderable for an Argentine engineering firm at that time. However, the quantity of exports fluctuated in inverse proportion to sales in the internal market.

The irregularity and unpredictability of the state-owned company's orders made it difficult to plan sales on the international market, which thus maintained their countercyclical character. What explained YPF's behavior? A long-term analysis points toward a weakness at the management level, which led to decapitalization through different income transfer processes. On the one hand, with respect to the internal market, this occurred via high taxes that drove up gasoline prices and through the purchase of goods and services on the local market at higher prices than on the international market. On the other hand, it occurred through exaggeratedly high absorption of labor to meet operating requirements. According to Arturo Sábato, an authority on energy matters in developmentalism, during Frondizi's administration, petroleum contracts resulted in labor costs rising to 50% of the company's total expenditures (Dachevsky 2013). In subsequent years, this cost did not decrease significantly, except for some attempts at adjustment. YFP's profit levels were scanty, and the company had to resort for several years to loans at negative interest rates

to sustain its financing. In 1975, during the final stages of the Peronist administration of Isabel Martínez, the company had negative net equity and was all but bankrupt (Dachevsky 2013).

Another negative impact, this time international – the petroleum shock of 1973 – rendered Siderca's export output more attractive, creating a strong incentive to intensify the improvement process that had started during the previous decade.¹⁵ One year after the energy crisis, the shareholders' meeting approved the implementation of a general expansion plan consisting of increasing steel production from 275,000 to 530,000 tons per year, and pipe production from 150,000 to 410,000 per year. The first stage comprised the installation of a direct iron ore reduction plant and a continuous rolling machine with the capacity to produce 125,000 tons of seamless pipes of up to 148 millimeters in diameter. Added to this was the first expansion of the steelworks to 365,000 tons.

The installation of direct reduction meant substituting scrap as an input with sponge iron, produced from natural gas. This was a genuinely radical innovation, entailing the replacement of one of the most sensitive parts of the technological system supporting steel production: the basic input used to feed the steelworks.

From a commercial standpoint, an increase in production on such a scale could not be supported by the local market. Prior to the reforms, the plant could not even consume 150,000 tons of installed capacity. This, as we have seen, gave rise to the plant's need, from an early stage, to have access to the foreign market. The implementation of the expansion and upgrade process in 1974, which finally was carried out between 1976 and 1978, showed that exports would be of increasing importance in the future. Moreover, the upturn in exports prompted by the new investments provided the resources necessary to repay the company's loans (Dálmíne-Siderca 1974).

However, export was conducted through traders, a phenomenon that stood in the way of ascertaining profit margins, commercial policy design, and an understanding of customers' needs. Nonetheless, a strategy emerged that, without seeking to globalize the company, placed increasing importance on the international market.

15. Each increase in the price of a barrel of oil spurs the the search for new oilfields, or drives the exploitation of those that had been abandoned due to a lack of financial viability. In both cases, this leads to demand for piping and inputs linked to oil exploration and exploitation. Moreover, an increase in oil exploitation always has the consequence of greater demand for pipes and all equipment utilized in exploration and production.

BETWEEN CRISIS AND CHANGE (1976–1979)

The investment plan, finalized in 1978, allowed Siderca to double its production of pipes and integrate the steel production process, improving its quality and making it less dependent on a supply of scrap. It also made productivity gains possible, amounting to an increase of 82% between 1976 and 1982 (Dálmine-Siderca 1982). However, these benefits only materialized in the long term. In the near term, debts to banks and suppliers remained which, in the midst of a recession, left the company in a delicate situation. This was exacerbated by the high interest rates that predominated locally at the time, as a consequence of the financial reform and the exchange overvaluation implemented by the military government in 1977. Both factors significantly increased the company's costs and worsened its financial situation, despite the increase in sales (Table 4).

Table 4
Siderca: pipe sales, 1974–1979 (in tons and percentages)

Financial year	Local sale		Exportation		Total (tons)
	Tons	%	Tons	%	
1974–1975	112,947	76	34,952	24	147,899
1975–1976	120,738	89	14,822	11	135,560
1976–1977	127,476	84	24,446	16	151,922
1977–1978	144,234	64	80,042	36	224,276
1978–1979	111,803	41	162,410	59	274,213

Source: Dálmine-Siderca (1979); compiled by author.

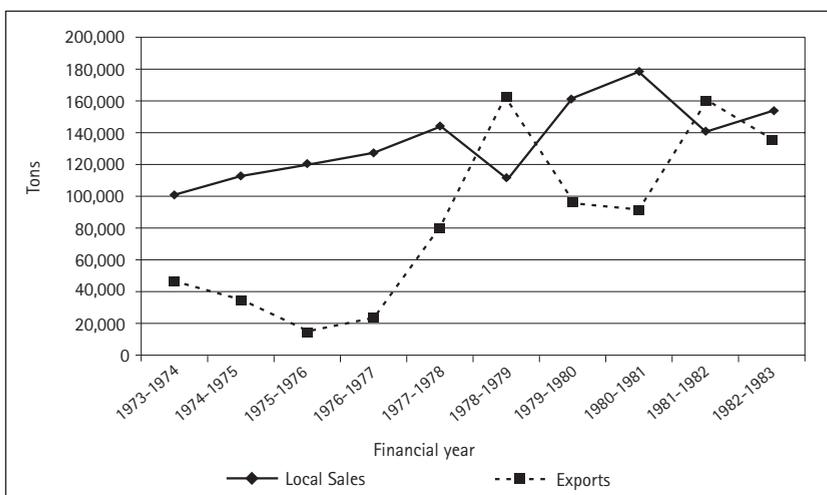
During the financial year 1978–1979, the company's net debt in foreign currency totaled US\$169 million (Dálmine-Siderca 1979). In turn, profit levels were far from satisfactory. Despite good sales performance during the 1978–1979 financial year, the company's operating results recorded losses in excess of US\$ 8 million that were covered by the profits of firms under its control, tax credit carryforwards from previous fiscal years, and the sale of its shareholding in the company Tubos y Perfiles.¹⁶ In the opinion of one of its then-managers, "the firm was close to being called to account before a group of bankers."¹⁷

16. This allowed final profits of close to US\$ 2.5 million (Dálmine-Siderca 1979).

17. Opinion of an engineer from the commercial area of Dálmine-Siderca (interview conducted in San Isidro, Buenos Aires, September 13, 2011). Translation by *Apuntes*.

How was Siderca able to emerge from this financial morass? A detailed analysis of sales, in terms of both quantity and destination (Figure 1) provides some indications. As well as exports, sales to the internal market had been on the increase since the 1973 petroleum crisis.¹⁸ Moreover, the early years of the dictatorship coincided with the "peripheral privatization" of YPF, with concessions for secondary exploration areas granted to the private sector.¹⁹

Graphic 1
Siderca: pipe sales, 1973–1983 (in tons)



Sources: Dálmine-Siderca (1976, 1979); compiled by author.

Both the new legal framework and the hydrocarbon investments announced by the government for the upcoming years explain the positive expectations that Agostino Rocca, still chairman of Siderca at the time, had with respect to the local pipe market, which

18. However, it should be recalled that internal sales involved not only YPF. A significant proportion went to the industrial market, above all to the petrochemical sector. This sales destination, known inside the company as the non-petroleum sector, accounted for a third of sales between 1973 and 1976. Lack of data prevents us from ascertaining the internal market sales destinations in the years that followed. On the other hand, sales to the local petroleum market included those made to private firms that habitually consumed between 5% and 10% of the production purchased by the state oil company (Dálmine-Siderca 1976)

19. See, for example, the article "Adjudica el país seis áreas licitadas" (*El Cronista Comercial* 1977a). However, the approval of the awards by the Energy Secretary, which were long-delayed, should have been followed by that of the national executive branch.

expanded compared to the international market due, above all, to the drilling of wells in the U.S.²⁰

All things considered, aside from the ups and downs of the fiscal years 1978-1979 and 1981-1982, growth in internal demand was quite modest. The 148,622 tons sold on average over the following six fiscal years (1977-1983) represented an average growth of just 33,066 tons for the four years leading up to the new regime; that is, an increase of 28% (Castro 2013).

Conversely, these expectations were met in the case of exports. In the fiscal year 1977-1978, when plant upgrades were nearing completion, Siderca's exports quadrupled from the previous fiscal year and doubled from 1974, the year in which the best export performance during the period between 1970 and 1977 was recorded. Once the second international petroleum crisis had begun, sparked by the Iranian revolution, sales to the international market doubled and exceeded domestic output. Moreover, though this was later to decrease, sales stayed at a high level. In the fiscal year 1977-1983, exports increased fourfold (Table 5). The strategic response of the new MM to this new business environment would trigger a process of irreversible change inside Siderca.

Table 5
Siderca: pipe sales, 1973-1983 (in tons)

Period	Average internal sales	Average exports
1973-1977	115,556	29,991
1977-1983	148,622	120,990
Increase between periods	28%	400%

Source: Dálmine-Siderca (1973-1983); compiled by author.

THE NEW MANAGERIAL STRATA AT SIDERCA

After the death of Agostino Rocca in 1978, the management of the company was assumed by one of his three sons, Roberto Rocca, who opted to replace Siderca's managerial strata with young executives who held the same positions at Propulsora Siderúrgica and who had joined the TG at the end of the 1960s.²¹

20. See: "Ha aumentado su producción Dálmine-Siderca" (*El Cronista Comercial* 1977b: 16).

21. Propulsora Siderúrgica was established in late 1969 in the Ensenada, Buenos Aires Province, close to the provincial capital. The company was created with a view to its transformation into a steelworks with a blast furnace for the production of hot- and cold-rolled steel. Because of the hurdles erected by the political authorities and the priority that the military oversight agency for steel gave to Somisa,

The Ensenada-based company thus contributed a series of MMs that took charge of different subunits and promoted a qualitative leap – first, in the pipe company itself and then in the TG as a whole. Thus, a significant process of upgrading and cultural change emerged from the very bowels of the group:

At this period, a rift occurs. It is not an evolutionary transformation. To express it in slightly harsh terms: it was a group that had all the tradition of Argentine industry, the idea of "making do and mending," etc. etc. And a rift occurs. New people are brought in, with different backgrounds, and objectives of excellence were sent. To this end, both on the managerial and the technical leadership fronts, a whole series of policies are developed that implied the absorption of knowledge from abroad, its incorporation, processing, and the creation of culture of our own. But it was a culture with very distinctive values. For example, great respect for production, for doing things properly, and the incorporation of technology. A move towards ongoing training, permanent measurement against international standards, and setting highly ambitious targets. And no involvement in the financial business. There was never a desire to get involved in it.

[...]

This opening up, this change in its genesis, I would say that it started with Roberto Rocca. [...] The siphoning of Propulsora Siderúrgica into Siderca somehow involved a break with the traditional school of Dálmine.²²

The new generation of managers were assigned the secret and informal nickname of "the young Turks."²³ They were graduates of Argentine universities; some had gained professional experience at U.S. companies and had received or would go on to receive postgraduate training at U.S. business schools, such as Cornell or Harvard. This new group of managers included Carlos Tramutola, Javier Tizado, Carlos San Martín, Alberto Valsecchi, Sergio Einaudi, Ángel Freites, and Ernesto Cossavella, among others.

Despite a degree of tension among the top management of the conglomerate, above all between Roberto Rocca and Hilario Testa, a long-time executive who had been Agostino's right hand man, the stance of the former took precedence and the new team was afforded a significant margin for decision-making and project development in a context of non-bureaucratized personal relations.

the state-owned steelworks, Propulsora Siderúrgica was reduced to the production of cold-rolled steel. For a history of that company, see Castro (2005).

22. Executive from the commercial area (interview conducted in San Isidro, Buenos Aires, September 20, 2011). Translation by *Apuntes*.
23. Historically, Young Turks was a reformist movement and party which, at the beginning of the 20th century, challenged Sultan Abdul Hamid II, who was deposed in 1909. They governed the Ottoman Empire until the end of the First World War.

I toured the North American universities and tried to find Argentine students who were studying at the prestigious business schools. I visited the school, invited them to lunch, talked to them and tried to seduce them into coming to work for the group. We reeled in some of them, but it was very difficult as in those situations the exchange rate issues didn't help [...]. But for those who could see a little further, though the company had yet to secure the multinational, global presence that it enjoys today, its impetus toward growth constituted a very big motivating factor. For all of us, and I include myself in this, what kept the adrenaline running high was the feeling that we were the owners of the thing, that we could make it grow, that we could run projects. All of this created a spirit of high motivation which differs from a typical large multinational, where everything is more or less stable. In a multinational of foreign origins, the positions that can be attained from Argentina are very limited. In general, certain responsibilities - and this I experienced for myself through my prior experience at an American multinational before joining the group: the main activities of technology, research, organizational structure, standards for plant operation, is something that came totally prepared through operating instructions handed down to the subsidiaries.²⁴

The difference cited by our interviewee with his prior experience at a multinational is clear, and appears to correspond with Amsden's observation: on the one hand, management as an entrepreneurial activity and, on the other, as a bureaucratic activity. In this regard, because they had not yet fully formalized their organization, at least at that stage, the MMs appeared well-placed to provide the leadership required to overcome resistance to change in the system in which the company operated.

THE BASES OF INTERNATIONALIZATION

Beyond the transformations that were to come in the long term, debt remained a pressing issue. The remedy began to emerge as a result of the recovery of international demand and prices that was in evidence during the fiscal year 1978-1979, despite the meager economic results. The price of a barrel of oil rose from US\$ 9 in 1979 to more than US\$ 12 the following year, and exceeded US\$ 31 by 1981. The demand for and prices of seamless pipes was correlated to these increases. The company started to reap the benefits of the investments made in preceding years, and was able to keep the internal market supplied while responding to growing international demand (Table 6).

24. Interview with an executive from the commercial area. Translation by *Apuntes*.

Table 6
Siderca: pipe sales, 1978–1985 (in tons and percentages)

Fiscal year	Total sales (in tons)	Exportation	
		Tons	%
1978–1979	274,213	162,410	59
1979–1980	258,339	96,491	37
1980–1981	269,838	91,505	34
1981–1982	301,132	160,182	53
1982–1983	289,881	135,315	47
1983–1984	316,058	125,984	40
1984–1985	311,081	137,122	44

Source: Dálmine-Siderca (1978–1985); compiled by author.

Between 1977 and 1980, foreign sales did not drop below 36% of the company's total sales, and, with the exception of the fiscal year 1980–1981, during the next five-year period the floor remained at 40%. At the same time, diversification of destinations began and sales with higher added value.

What was done with the resources obtained as a result of the positive worldwide oil situation? According to the interview with the executive from the commercial area, a wide range of options were examined. This included the prospect of diversifying into other areas. However, management opted for technological upgrading and expansion, along with an increase in the company's business network abroad. In order to achieve the first objective, US\$ 600 million were invested between 1984 and 1988. When making this choice, following Floyd and Wooldridge (1992), management decided to take advantage of an economic opportunity based on favorable international market conditions to consolidate and formalize an internationalization strategy in which the lynchpin was foreign sales. It is no coincidence that the main driver of change was an executive in the commercial area, who was responsible to a large extent for the company's revenues (Mair and Thurner 2008).

The technological upgrades that would sustain commercial expansion placed Siderca at the international technological forefront and, in turn, enabled new qualitative and quantitative expansions in production. This primarily consisted of the installation of the LACO 2 continuous roller – which was custom designed and took advantage of a series of concepts developed in the LACO 1 – as well as the continuation of ongoing staff-training initiatives set in motion starting in the previous decade.

The following testimony attests to the change brought about by the new state-of-the-art rolling technology in the production of seamless pipes.

Engineering veterans insist that prior to the implementation of LACO 2, it proved impossible for any Siderca representative to secure an invitation to see a Japanese roller. However, after 1988, it was the Japanese who were desperate to go to Campana (*Sin Costura* 2004: 79).²⁵

Siderca's technological commitment was financed through company funds (47%), foreign financing (44%), and local loans at market rates (9%) (Siderca 1987-1988: 20).

With respect to the commercial network, though this required much less resources than the technical transformation, it was the first experience of investment abroad and was a necessary change of routine in commercial terms. The new group of managers had a vision that differed from that which prevailed previously, and they felt that Siderca's organizational concepts were outmoded. For instance, it had been understood that commercial aspects had no place in an industrial company. Indeed, exportation depended on local and international traders whose mediation, as we have seen, made it difficult to ascertain both the prices paid by customers and their needs.²⁶ Thus, this difference in perception, quite apart from the opportunities offered by the international market at that time, was also a factor in the strategic change.

Several years after the start of the revitalization process, Ernesto Cossavella affirmed:

At that time, the most significant commercial challenge for Siderca was not so much the internal as the foreign market. We had few marketing channels; locally, an important customer like YPF, as well as a distributor for the rest of the oil companies, and another three links involved in the industrial area. Internationally, we were also dependent on distributors: one for the United States and another for the rest of the world. The great challenge was to transform Siderca from a local company that sent its export surplus abroad in an internationally recognized approach, to a firm with a genuine export pedigree to accompany the productive and technological expansion enabled by LACO 2.²⁷

The implementation of the distribution network initiated in November 1982 with the creation of Siderca International, headquartered in Panama and with the capacity to grant

25. Translation by *Apuntes*.

26. Cited interview with executive from the commercial area.

27. Interview with Ernesto Cossavella, engineer in Siderca's commercial area in the 1980s and 1990s (*Sin Costura* 2004: 92). Translation by *Apuntes*.

and accept credits, sureties, and guarantees, and to trade in public securities (Dálmine-Siderca 1982). Along similar lines, the report for the financial year 1983-1984 cites the establishment of Siderca Corporation in Houston, United States. Cossavella himself moved there. The aim was to displace the local distributor, who prevented the company from reaching its customers. The first step was to seek out the companies to which the intermediaries had not made any sales, then to target the big oil companies that could only be accessed through direct sales from the producer. According to Cossavella, the negotiation and trader displacement process in the United States took almost three years (*Sin Costura* 2004).

Another important step was the opening of a commercial office in China in 1990, the product of an encounter during a reception at the Argentine Chancellery with a Chinese trade mission.

There [at the reception] I met the president of Minmetals, then the only Chinese importer of industrial supplies. Of course, I invited him to Campana and, to our surprise, he was interested in buying pipes because he wanted to develop alternatives to the Japanese provision that held them captive. The thing is that we sold them about forty thousand tons. It was a hell of a thing (*Sin Costura* 2004: 92).²⁸

Another commercial prospect in those years was the Soviet Union, which started out through the commercial manager with a trip procured at a travel agency so as not to attract the attention of the trader, and ended up in direct contact with the Soviet oil companies.

In 1988, an office was set up in Singapore and Jorge Blanco and Augusto Bianco were in charge. The objective - not at all easy - was to secure the oil companies that operated in Singapore as well as in Malaysia and Indonesia - natural markets for the Japanese tube producers.²⁹

Finally, we again draw on the testimony of Ernesto Cossavella for an assessment of the building of a commercial network abroad, embracing technological change in the 1980s, and the benefits of having direct access to the Chinese and Soviet markets during that decade:

28. Translation by *Apuntes*.

29. According to Jorge Mayer: "When I introduced myself as representative of Siderca at a company with headquarters in Jakarta, Indonesia, they asked me: "What's that? A dry cleaner's?" (*Sin Costura* 2004: 93). Translation by *Apuntes*.

We had to realize that we were novices, that nobody knew us on the international market, and, as a result, the chances of achieving significant improvements in a short time were very difficult. What helped us a good deal was the success attained in consolidating sales to China and the Soviet Union, which purchased large quantities every three or six months, through direct negotiations. It was an important undertaking that was carried out with considerable professionalism and with the aid of the simultaneous developments in technology and efficiency in the plant, which was always our strong point. Of course, except during some crisis or other, the plant was always full; if not for 21 shifts, at least 18. The aim was to keep the plant running at full capacity and we achieved that, facilitating accelerated improvement in industrial efficiency, as there's nothing better than having the plant pushed to the limit. In this way, we passed several years with our guard held high, which turned Siderca into a company that was always in shape, always looking to improve, on its way to becoming a world leader (*Sin Costura* 2004: 92).³⁰

The productive evolution for the second half of the 1980s is presented in Table 7.

Table 7
Siderca: pipe sales, 1985–1990 (in tons and percentages)

Fiscal year	Total sales (in tons)	Exportation	
		Tons	%
1985–1986	338,358	206,357	61
1986–1987	328,735	233,907	71
1987–1988	400,840	245,970	61
1988–1989	408,800	298,800	73
1989–1990	502,210	407,180	81

Source: Siderca (1985–1990); compiled by author.

The new commercial routine of making direct contact with customers and setting up offices close to them, along with the commitment to technological upgrading, had a positive impact on the company's international sales. The figures between the beginning and the end of the second half of the 1980s are revealing. Exports were no longer marginal or countercyclical, as had been the case in previous decades. The objective of the MM that had entered at the end of the 1970s to strategically realign the company toward the international market had been achieved.

30. Translation by *Apuntes*.

THE GLOBALIZING LEAP OF THE 1990S

Despite the severe challenges posed by Argentina's economic instability in the 1980s, Siderca's micro-situation at the start of the 1990s was heartening. In the area of finances, this was fundamentally due to the accumulation of profits resulting from the company's productive, technical, and organizational expansion, as well as the revenues accrued through the liquidation of liabilities sanctioned by the military regime for companies with foreign debt through exchange rate hedges (Table 8). The series of profits accumulated between 1979 and 1990 is consistent with the US\$ 449 million in retained earnings declared by the company in the fiscal year 1989-1990.³¹ Added to this is the appraisal revaluation reserve which, according to the same balance, totaled around US\$ 13 million. In turn, in the fiscal year 1991-1992, when monetary stability and peso-dollar parity enabled greater accounting and monetary transparency, retained earnings were worth US\$ 550 million and technical reserves, US\$ 142 million.³²

Table 8
Siderca: tax-free accumulated profits, 1979-1990 (in dollars)

Balance	Profits (net, for the year)
1979-1980	27,307,196
1980-1981	30,979,982
1981-1982	67,215,529
1982-1983	61,836,949
1983-1984	64,297,308
1984-1985	70,344,841
1985-1986	32,053,299
1986-1987	606,692
1987-1988	48,312,161
1988-1989	17,464,336
1989-1990	163,368
Total del periodo	420,581,661

Source: Siderca (1979-1990); compiled by author.

31 This sum is deduced from the declaration of retained earnings of 2,380,414,983,000 australes, and an exchange rate as of March 1990 of 1 dollar = 5,310 australes. By our estimation, in the period 1976-1980, the company accumulated US\$ 15 million in revenues, so the convergence between the company's declaration and our calculations is even greater.

32. The accounting entry "technical reserves" is utilized in situations of uncertainty, in order to avoid payment or distribution of profits.

This financial and equity solvency allowed the company to overcome the reduction in demand and the price fall on the international pipe market, precipitated by the political crisis and the disappearance of one of its main customers, the Soviet Union. The company's management was in no doubt about what would happen on the world market:

Global supply is slowly adapting to the new circumstances of demand. There have already been a number of European and American plants that have stopped or will stop producing in the near future due to an inability to compete. Only the most efficient companies will remain in the market, and Siderca will surely be one of them.³³

Once the crisis was over, the company retained enough capital to absorb companies with financial problems. It then started to acquire companies in Mexico and Italy in the first instance, followed soon afterwards by firms in Japan, Brazil, Venezuela, and Canada. Paolo Rocca, son of Roberto and chairman of Siderca in the 1990s, was the architect of this expansion. In one way or another, he followed the path embarked upon by both the company and group in the 1980s, the latter through the acquisition of Siat in 1986 and Somisa at the start of the 1990s. Thus, the company had proven its capacity for reforming and redirecting existing plants.³⁴

This also helped persuade the group to acquire Tamsa in Mexico and Dálmine in Italy, with both of which Siderca had historical links. These purchases elevated the company to the status of a leader in the international pipe market. As publicly-owned firms, both had undergone the fiscal deterioration to which the entrepreneurial state was subject in their own countries, and were left in a debilitated commercial and financial position. Relatively similar events played out in the acquisition of other plants in Canada, Japan, and Venezuela. The possibility of reconverting them can also be explained by the capacity of the engineers employed by the firm and the group, who had been locally trained.³⁵

33. Roberto Rocca, in a message from the company chairman to shareholders in the ordinary meeting of July 1992 (Siderca 1992). Translation by *Apuntes*.

34. The purchase of the state-owned steelworks Somisa by Propulsora Siderúrgica, largely due to pressure from the management group – once it had assumed corporate responsibilities – more than the capacity of the top management of the group, demonstrated the capacity of the TG to reform industrial firms at a critical stage of technical and organizational deterioration. This confidence aided Siderca in its decision to acquire plants abroad.

35. Mexico and Venezuela counted state-owned oil companies among their customers (Pemex and PDVSA), neither of which could be bailed out by their governments in the face of the financial crises they had been exposed to in the 1980s and 1990s. In the Italian case, this occurred due to the general decline of all state-run industrial companies, in a process dating back to the 1960s. On the Italian case, see Amatori (1997); for the Mexican and Venezuelan cases, see, respectively, Giacalone (2004) and Garrido (2001).

SOME FINAL CONSIDERATIONS

We analyze the trajectory of a steel company that started out in the midst of the import substitution phase as a supplier to a state oil company and ended up with a majority share of the international pipe market by the 1990s, outperforming its peers in the advanced countries. One of the first findings of this analysis is that an interpretation of accumulation based on linear evolution, as an apparent consequence of monopolistic positioning and transfers made by the state to the company, should be avoided. The link with YPF, a central plank of the company's early strategy, was considered - empirically - more of a weakness than a strength. To cushion the effects of an erratic customer, in the 1960s, exports were peripherally injected into this internal market-oriented strategy.

The petroleum crisis of 1973 opened up new export opportunities that, despite stimulating significant investment, were yet to emerge as Siderca's central strategy. If we add to this YPF's problems and the instability of the Argentine economic environment, Siderca's intensification of an internal market-oriented strategy in the 1970s, after two decades of existence, appears unrealistic.

The financial problems brought about by investment in upgrades following the international oil crisis prompted the company heads to effect a change in management and, perhaps as in all situations of crisis, to overcome bureaucratic resistance. Consistent with the literature on EGs, the TG turned out to be a reservoir of technical and professional personnel. Thus, the new middle management arose through managerial siphoning from the group's steel-producing forms. This opened a new historical chapter, led by a young pack of professionals who created a formalized strategy out of internationalization and globalization, attempting to remove the obstacles in the way of such a move. Their entrepreneurial capacity perhaps was boosted by the informality that prevailed in the structure of the TG.

In turn, foreign investment commenced in the 1980s. It was aimed at forming a commercial network to liberate the pipe manufacturer from intermediaries, who constituted a fundamental obstacle to consolidating the company's internationalization. Their removal allowed Siderca to ascertain customers' needs, increase its profit margins, and access new markets. This required a cognitive change: overcoming the classical conception of a metallurgical plant - which was, to some extent, a legacy of the 19th century industrial tradition - and forming a commercial services area abroad. But this vision was accompanied by good fortune: the prices fetched by pipes on the international market towards the end of the 1970s. This opportunity was not confined to the fortuitous exploitation of a situation, but constituted an incentive to deepen and formalize a strategy that to some extent had been in a "state of emergency" since both the international oil crisis of 1973

and due to the ongoing instability of the domestic economy. These processes, by removing the company's commercial reliance on the internal market and inserting it in the foreign market, also signified a strategic reformulation.

The fact that the middle management group was responsible both for implementing the strategy and designed it on the basis of its distinct vision of the industrial business, suggests to us, as per Mintzberg (1978), the impossibility of discerning specifically between action and cognition with respect to the process of strategy formulation. Consequently, this seems to be the consequence of a series of decisions in which action and cognition were implicitly combined.

Who among the group of managers in charge of the different subunits led the change process? It is significant, in line with the study by Mairt and Thurner (2008) regarding the managers who become most involved in internationalization processes, that it was an individual responsible to a large extent for the company's revenues who could claim ownership of the results of the internationalization: the commercial director. This coincidence is striking, since the case analyzed here, unlike those of the authors cited, relates to a large company with thousands of employees.

Investment abroad was accompanied by investment in the production plant itself and in staff training. In the case of the latter, the investments were made locally, though training of executives also took place at foreign business schools, without which the internationalization process may well have failed. Training and investment in infrastructure and the commercialization network were constituent components of an integral strategy of internationalization and, subsequently, globalization. That takes us back to Chandler's triple investment. This "top-down" investment in the structure was offset by the upward influence that deepened and formalized the company's strategy, which continued even when some of the MMs ascended to the corporate management and also transformed the group itself.

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