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Resumen

La importancia del capital extranjero en empresas que operan en sectores con infraestructura (ferrocarriles o energía, por ejemplo) y la distancia geográfica entre el origen de ese capital y el lugar de operación introducen problemas de agencia, que son un factor crítico en el gobierno de estas empresas. Las free-standing companies o compañías autónomas constituyeron una respuesta bastante frecuente a estos costes de agencia. En el presente artículo se intenta evaluar el modo en que otro tipo de compañías aborda esta cuestión y cómo esto afecta no sólo a las reglas y la estructura formal de organización, sino también y especialmente a prácticas de gobierno corporativo informales.

Palabras clave: inversión extranjera; problemas de agencia; energía; gobierno corporativo; Portugal.

Abstract

The importance of foreign capital in firms operating in infrastructure sectors (railways or energy, for instance), the geographic distance between the sources of this capital and the location of operations introduce problems of agency as a critical factor in the governance in these firms. Free-standing companies had been a usual response to these agency costs. In this paper, one tries to evaluate how other type of companies deal with this issue and how it affects not only formal governance structure and rules, but mostly informal governance practices.

Key words: foreign investment; agency problems; energy; governance; Portugal.

Foreign capital and problems of agency: the Companhias Reunidas de Gás e Electricidade in Lisbon (1890-1920)¹

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1. Foreign shareholders and agency costs

Nineteenth-century Portugal was a poor country, suffering from deficiencies in capital supply and entrepreneurial initiative². At the same time, scientific and technological knowledge was also deficient. The introduction of modern urban infrastructures (particularly in power and transport) and railways during the second half of the nineteenth century was a decisive challenge to a country lacking capital, technological and organizational resources. Access to the international financial markets as well as human capital became critical to the introduction of these network infrastructures in Portugal, as it was emphasised in a previous study on railways³. The creation of foreign firms in these sectors internalised financial capital markets and technological capabilities. The internalisation of financial capital was not restrained to equity. In fact, the access to bond issues in sophisticated markets by these foreign firms operating in Portugal was even more important, because transaction costs would be exceptionally high for domestic entrepreneurs⁴.

¹ Research activity included in the research project POCTI/HAR/60698/2004 – Networked Cities: urban infrastructures in Portugal (1850-1950).

² Lains and Silva (2005).

³ Silva (2005).

⁴ Hennart (1998).

[144]

However, the competitive advantage of these foreign firms was not only financial. Mobilising technical and organisational capabilities was another source of competitive advantage over domestic projects. These foreign firms had access to a network of managers and technicians, sometimes with a previous career in railway construction or energy supply in other countries. The existence of clusters of financiers, managers and technicians operating in different firms across Europe is a characteristic peculiar to these network infrastructures.

The importance of foreign capital in these firms, the geographic distance between the sources of this capital and the location of operations introduce problems of agency, a well-known concern in organizational studies⁵. An example of these problems of agency comes from the relationship between the shareholders and the managers who run a company. Jensen and Meckling identified three components of the agency costs: monitoring expenditures, bonding expenditures and residual costs⁶.

Two main types of challenges had to be overcome by these firms. The protection of the property rights of the foreign shareholders was an important issue, in order to provide a guarantee for investments made in countries, such as Portugal, with a poor reputation in the foreign capital markets. The second challenge is related to the strategic and operational decisions of a company with activities located far away from the source of the capital. If any organizational structure in which the ownership is separated from management gives rise to agency costs, the geographical separation between the most important shareholders and the country which hosts the operational activity of the firm amplifies the costs associated with the relation between principal and agent.

This paper tries to contribute to what Jensen described as a “positive theory of agency”⁷. It starts from an appraisal of previous findings on railway business, which tried to explain the impact of distant ownership, local operations and high sunk costs on the design of organizational structures and governance practices to secure property rights. Using these findings as a research framework, this paper tries to look at the energy business in late nineteenth century and early twentieth century Lisbon and ask the same set of questions. The fact that the railway business share some characteristics with the energy sector –foreign ownership, high sunk costs, local operations, distinction between ownership and local management– makes the comparison promising.

2. Dealing with agency costs: free standing companies and bicephalous organizational structures

Throughout the last decades of the nineteenth century, the free standing company developed as a possible organizational solution to the challenges presented

⁵ Jensen (1998) and (2000); and Brickley (2001).

⁶ Jensen and Meckling (1976).

⁷ Jensen (1993).

in the introduction. Even if the operational activity took place overseas or very far away from the sources of capital, the legal constitution of the free standing company was drawn up in the country where the investment originated, with the Board of Directors also being based there, the operational management being moved to the country receiving the investment⁸. At the same time, these companies had no kind of activity in the country where the capital originated and where the Board of Directors was based, thus being remote from the classic cases of multinationals⁹.

Locating the Board of Directors in the originating country was a way to defend the property rights of those holding the share capital, subjecting the operation and management of the company in a third country to the commercial and societal legislation of the originating country¹⁰. Although it is possible that a whole range of distinct characteristics for intervention exists on the part of the headquarters, it is only the existence of management competencies located outside the country where the investment is made that makes these companies a distinct case regarding domestic companies, but owned by foreign citizens operating locally¹¹.

However, other organizational structures and models of governance could be found which tried to solve the agency dilemmas posed by the distance between capital and operational activity. In Portugal, there is no known existence of free standing companies. Nevertheless, the protection of the property rights and the control over strategic and operational management decisions by the foreign investors were issues which should also be faced. The example of the Companhia Real dos Caminhos de Ferro Portugueses is in this sense very interesting, as it provides a model of how these agency challenges were faced and overcome. This railway company was created by a complex network of foreign investors, mostly located in Spain, France, Germany and Britain¹². In contrast with free standing companies, its headquarters were established in Lisbon, where the Board of Directors seated, but the existence of a delegation of administrators in Paris is foreseen. However, this so-called Paris Committee had a formal role that was far more important than that which may be deduced from the statutes. It is made up of nine administrators representing the most important foreign investors. This number alone is significant, since this figure is greater than that of the Board of Directors in Lisbon, which comprises only six members. The Chairman of the company also sits in the Paris Committee and not in the Board of Directors located in Lisbon.

⁸ Casson (1994) and)1998); Hennart (1994) and (1998); Jones (1998); Miller (1998); and Wilkins (1988).

⁹ The explanation for the direct investment of multinationals lies in the existence of a certain competitive advantage that is obtained by these companies in the originating country, which leads them to choose direct investment rather than any other form of contract with a local enterprise [Markusen (1995); and Caves (1996)].

¹⁰ Wilkins (1998).

¹¹ Corley (1998).

¹² A detailed analysis of the Companhia Real is presented in Silva (2005).

[146]

Therefore, the organisational structure and the governance practice ends up recognising the decisive importance of the Paris Committee. Besides the number of members and the presence of the Chairman of the company in this board, another sign of the importance of the Paris Committee in the organisational structure of the company is revealed by the presence of an executive administrator, who is responsible for the day-to-day decisions of the Companhia Real that are managed from France and for liaising with the Board of Directors based in Lisbon. The Paris Committee also had an engineer whose role is above all that of consultant in relation to the technical aspects of the construction and exploitation of the railways. He is also, at times, sent to Lisbon at some of those crucial moments in the implementation of the strategy for integrating the Companhia Real in an international modal and inter-modal transport network, strategy followed after the mid-1870s. The financial and capital accounting of the company was also done in Paris, emphasizing the relevance of the Paris Committee.

Moreover, being one of the heads of a bicephalous directive structure, the real powers of the Paris Committee are revealed by the actual governance and location of decision-making within the company in strategic and operational issues. In fact, the company strategy is delineated entirely in Paris, and afterwards presented and ratified in Lisbon. Even decisions of less relevance and which are concerned with the management of the railway exploitation in Portugal or with personnel are still taken in Paris.

The railway companies were not the only foreign companies which faced the challenges presented in the first section. Other investments in infrastructure and network firms had similar characteristics. Therefore, in the next section the model found for the Companhia Real will be used to present the case of the Companhias Reunidas de Gás e Electricidade, trying to look at the way how these agency costs were incorporated in the organizational structure, as well as in the formal and informal governance. A comparison between the different solutions provided for similar agency problems will contribute for introducing a historical account of organizational and governance outcomes.

3. Gas and electricity in Lisbon: from the Companhia Lisbonense Iluminação a Gás to the Companhias Reunidas de Gás e Electricidade

Although the decision to create urban infrastructures for gas and electricity was one of the responsibilities of local councils, the concession for their building was granted to private enterprise right from the very beginning. The enormous sunk costs involved in the creation of such an infrastructure and the limited capital available to the councils, which in most cases between the second half of the 19th century and the beginning of the 20th century were faced with budget deficits, prevented them from taking on such a financial burden¹³.

¹³ Silva (1998).

The shortage of capital and the nationwide lack of technical and business knowledge in this sector were crucial factors in determining that a large proportion of these infrastructures were paid for by foreign investors. In order to attract investment, the State granted tax exemptions on the importation of machinery.

Lisbon, the capital, was the first Portuguese city to invite tenders for the concession to build and operate the gas lighting system. Responding to this invitation were various Portuguese and foreign businessmen, and the contract was awarded to Hardy Hislop¹⁴, who in 1846 set up the Companhia Lisbonense de Iluminação a Gás, whose capital was mainly divided amongst Portuguese shareholders.

Until 1887, gas distribution in Lisbon was managed by this company on a monopoly basis. From 1887 onwards, it also took responsibility for the distribution of electricity. Throughout this period, there were constant conflicts between the local council and the company. On the one hand, these conflicts arose because of their different interests –whereas the council wished to obtain greater quality in public lighting at lower prices, the company sought to obtain higher profits by increasing prices based on the cost of raw materials. On the other hand, the council's financial deficit resulted in an accumulation of debts to the company due to the lack of payment for public lighting.

In 1887, the concession for public lighting was awarded to Sociedade Anonyme d'Eclairage du Centre, from Brussels, but the high costs of implementing a new gas network and the risks involved in a market where only the supply of public lighting could be guaranteed forced the company to make attempts to attract fresh capital. To this end, a joint-stock company was formed, Companhia do Gás de Lisboa, together with the other foreign companies that had also presented tenders for the gas lighting concession: Compagnie Générale pour l'Eclairage et le Chauffage par le Gaz–Gás Belga, also from Brussels; Khon Reinach & C^a; and P. M. Oppenheim¹⁵.

The Compagnie Générale pour l'Eclairage et le Chauffage par le Gaz–Gás Belga became the most important shareholder. The foreign investment policy was dictated by the need to increase the number of gas concessions, at a time when urban concessions in Belgium were already exhausted. In 1869, Gás Belga had eight gas factories in Italy, two in Germany and three in Belgium, and, in 1887, when it took out shares in Companhia Gás de Lisboa, it joined forces with Banque d'Escomptes de Paris and Compagnie du Centre de Bruxelles to bid for the gas concession in Carcassonne. It was at this time that the company was at its largest¹⁶.

¹⁴ Hardy Hislop had also shown interest in investing in the Portuguese railways,

¹⁵ Sociedade Gás de Lisboa was set up with a capital of 1.260.000\$000, divided into 28.000 shares of 45\$000 each. Part of the capital of this new company was deposited at the Lusitano and Lisboa & Açores banks. Martins and Coelho (1998), p. 24.

¹⁶ Brion and Moureau (2005), p. 228.

[148]

The international links enjoyed by this Belgian company were not unique¹⁷. The interest shown by foreign companies in investing in the running of gas networks in Portugal was part of a policy for the internationalisation of capital that had been a distinctive feature of this sector during the second half of the 19th century. Although the operation of gas networks required large investments and involved high sunk costs, it did allow for high dividends to be obtained in the medium-term¹⁸.

While it was operated on a monopoly basis, gas distribution in Lisbon was a profitable business, a situation that was altered when Companhia do Gás entered the market. From 1889 onwards¹⁹, although the supply of gas for public lighting was subject to concession, gas for private consumption began to be supplied on a competitive basis. This situation created serious financial difficulties for the two companies operating this public service in Lisbon. Operating in a market in which private gas consumption did not reach levels that were profitable, these companies were faced with serious financial difficulties. The merger of the two companies was the solution found to make them economically viable. In 1891, Companhias Reunidas de Gás e Electricidade (CRGE) came into being with a capital consisting of 124,000 shares of 45\$000 (250 francs) each²⁰. Shares in the former companies were exchanged for shares in CRGE, which preserved the influence of the main foreign shareholders of Companhia do Gás de Lisboa in CRGE²¹, as well as of Compagnie Générale pour l'Eclairage et le Chauffage par le Gaz-Gás Belga.

Until 1913, the foreign companies with the largest number of shares were Compagnie Générale pour l'Eclairage et le Chauffage par le Gaz, S. Propper & Compagnie, Société Watel, Dehaynin & Compagnie, Compagnie Générale Française et Continentale d'Eclairage par le Gaz and Crédit Algérien. In the early 20th century, the major individual shareholders either holding or personally representing the largest number of shares were George Kohn, Adolpho Oppenheim and Theodore Verstraeten.

¹⁷ Cf. Williot, (2004), pp.165-166.

¹⁸ As is shown by the operation of gas networks in several countries. Even in Lisbon, the management of this business by Companhia Lisbonense de Iluminação a Gás had made it possible to pay out significant dividends: 1851, 6%; 1852, 7.5%; 1853-1870, 6%; 1871, 10% ; 1887-1888, 25%.

¹⁹ Although the concession had been awarded in 1887, it was only in this year that the gas distribution network of Companhia Gás de Lisboa was completed and the company began operations. Up to then, gas continued to be distributed by Companhia Lisbonense de Iluminação a Gás.

²⁰ This capital was formed from the assets of the two previously existing companies valued at 5,400,000\$000 and a reinforcement of 180.000\$000, which was to be subscribed to by shareholders.

²¹ In October 1892, CRGE had already received 14.136 shares from Companhia Lisbonense de Iluminação a Gás and handed out 35.340 shares in its own company AHFEDP, CRGE, Relatório do Conselho de Administração 1891-1892, p. 9.

[149]

Table 1. The largest shareholders in CRGE (1901-1911)

	1901	1908	1909	1910	1911
Adolpho Oppenheim	3.000	575	502	425	500
Crédit Algérien	1.500	1.145			
Cie Générale Française et Continentale d'Eclairage par le Gaz	2.322	4.800	4.822	4.822	4.822
Cie Générale pour l'Eclairage et le Chaussage par le Gaz	15.843	15.943	15.943	15.943	9.916
George Kohn	4.000	4.000	4.100	4.100	4.000(a)
Siegfried Propper	988				
Propper & Compagnie	12.406	11.782	9.826	8.226	7.926
Société Watel, Dehaynin & Compagnie	7.000	7.016	7.585	7.585	7.504
Theodore Verstraeten	1.044	984	1.084	1.084	1.154

(a) After this date, the shares belonged to Madame Eugene Kohn. In this year, George Kohn (the son?) held 2.200 shares.

Source: AHFEDP, CRGE, Minutes of the meetings of Board of Directors.

Table 2 shows the proportion of foreign capital, which was always above 40% and rose significantly to 68,7% as from 1914 onwards. This increase arose from the subscription by Société Financière de Transportes et Entreprises Industrielles (Sofina) to the 96.000 new shares created at that time. With this purchase, Sofina became the major shareholder with 43,6% of the total of the company's shares.

Table 2. Proportion of shares held by foreigners (1891-1914)

Year	Shares held by foreigners (a)	% of total shares	Total shares
1891	51.522	41,5%	124.000
1913	55.295	44,5%	124.000
1914	151.295	68,7%	220.000

(a) Only the shares represented in the General Meetings are shown

Source: AHFEDP, CRGE, Minutes of the meetings of Board of Directors.

Sofina, which had been created in 1898, began in 1905 to invest in several foreign countries, such as Spain, where Tramways de Barcelona was founded in 1905, also operating in Bilbao²². A significant contribution was made to this pol-

²² Brion (1994), pp. 217.

[150]

icy by Heineman, who joined Sofina in 1905, organizing the company's technical services and enabling it to expand its business.

4. Organizational structure and governance at CRGE

The organisational structure of CRGE can be reconstituted from the articles of association with which the company was created in 1891²³ and the minutes of the meetings of the company's various governing bodies.

The articles of association of 1891 established the existence of a Board of Directors composed of 16 members, eight of whom were foreign while the other eight were Portuguese. This board was elected for a period of three years²⁴, after which it was planned that the number of members could be reduced, although the same ratio of an equal number of Portuguese and foreign members was to be maintained.

As this was a company that had come into being as a result of the merger of two companies, the interests of these companies were both represented in the Board of Directors elected in 1891. Representing Companhia Lisbonense de Iluminação Gás were António Centeno²⁵ and José Street da Cunha. The various foreign companies that had interests in Companhia do Gás de Lisboa, where the majority of the capital was in foreign hands, were represented by Eugene Breittmayer, Walhelm Pfizmayer, Theodore Verstraeten and Victor Terclin Monjot. Over the years, there was little rotation in the members that composed this board.

Although the articles of association stipulated equal representation and decision-making power for the Portuguese and foreign members of the board, a comparison made between the rules established under these articles and the actual way in which the functions were performed shows that foreign investors had more influence.

The articles of association approved in 1891 established that the company's head office would be located in Lisbon and that there could be a regional office located in Paris. The organisation of the Paris office and the definition of its powers and duties were to be established by the board of directors. In practice, the Paris office had the same number of members as the board of directors based in Lisbon and its organisation became the responsibility of the members of the board resident in Paris and Brussels.

Furthermore, from the time of the creation of the company and until 1915, the chairman of the board was always one of the foreign shareholders who were to be found at the Paris office²⁶. In 1891, Baron de Soubeyran was elected, who

²³ And the successive alterations that were made to these articles.

²⁴ Only shareholders who held more than 100 shares could be members of the board.

²⁵ In 1901, António Centeno had 1.350 shares and was one of the largest Portuguese investors holding nominal shares.

²⁶ In 1915, Portuguese law was to stipulate that the position of chairman of the board of directors should always be handed to a Portuguese member.

remained in office until 1894, when he was replaced by León de Somzée. In 1903, Theodore Verstraeten became chairman of the board and remained in this post until 1915. Both León Somzée and Theodore Verstraeten represented the interests of Compagnie Générale pour l'Eclairage et le Chauffage par le Gaz—Gás Belga, the largest shareholder of CRGE until 1913. In 1867, Somzée had been appointed chief engineer of Gás Belga, and Verstraeten was the managing director of the same company in 1887.

In actual practice, the Paris office (also referred to as the Paris committee) had a greater decision-making power and control than was provided for in the articles of association. Firstly because it was here that the chairman of the board was to be found, who enjoyed a casting vote. Secondly, because, although he lived abroad, the role of the chairman was to intervene directly in the running of the company, travelling regularly to Lisbon. Finally, because the Paris office enjoyed effective control over the company's financial management through the regular inspection of its accounts²⁷.

Despite living abroad, the chairman of the board of directors travelled to Lisbon on a fairly regular basis, doing so particularly on those occasions when production conditions or the company's financial situation called for the taking of decisions that not only required large-scale building work, but also implied sizeable investment. This was what happened, for example, in 1902, when the deteriorated state of the factory premises and the need to step up gas production in order to meet the growing demand, required the undertaking of fairly major building work, namely the building of new gasholders and the purchase of more modern equipment²⁸. In view of the scale of the work to be undertaken, Verstraeten travelled to Lisbon in March 1903, accompanied by the other foreign directors, in order to assess the situation, and the decisions were only taken after he had expressed his opinion on the matter²⁹. This situation demonstrates the major influence of foreign directors on decisions about major investments.

While the post of chairman was always entrusted to foreigners, the post of deputy chairman was entrusted to a Portuguese member of the board of directors, who presided over the meetings that were held at the company's head office in Lisbon. According to the articles of association, the members of the board residing in Lisbon were to meet on a fortnightly basis, and this frequency is confirmed by the analysis of the minutes of their meetings. The frequency of meetings in Paris is not mentioned in the articles, but in 1892 the board of directors decided that the members who were resident abroad should meet monthly either in Paris or Brussels. Most of the decisions taken by this body required the presence of at least one quarter of its members or the representation by proxy of at least two

²⁷ An analysis made of the minutes of the meetings of the board of directors held in Lisbon and Paris shows that the Paris office had both a formal existence and a form of intervention that were more important than the ones that could be gleaned from the articles of association.

²⁸ This situation was described in the report presented by the manager Paul Collart. AHFEDP, CRGE, Actas do Conselho de Administração, 1900-1907, fols. 86-87.

²⁹ For more information on this subject, see Matos *et al.* (2005).

[152]

thirds of the members. Voting rights could be exercised by letter or telegram, which was why the agenda for meetings held either at the head office or abroad needed to be made known at least ten days in advance.

The articles of association also granted the board of directors full powers to decide upon the conditions for the issue of loan securities, the placement of available capital, the use of capital and reserves and the distribution of dividends. The purchase or sale of assets, the establishment or alteration of contracts for the supply of gas and electricity and the fixing of tariffs were other matters for which this body was given responsibility. Some matters, such as increases in capital, the acquisition of new concessions or factories, mergers with other companies or participation in other gas and electricity companies required the approval of decisions taken by the General Meeting.

The articles of association also provided for the appointment by the board of directors of a managing director and stipulated what his powers and duties were to be. Throughout the period under analysis, this post was always filled by a Portuguese director, António Centeno, who thereby ensured a more effective circulation of information between the directors that were in Lisbon and those that lived abroad, travelling for this purpose to Paris or Brussels on a regular basis. This managing director was also responsible for conducting negotiations with the government or the Lisbon Municipal Council relating to alterations in the conditions for the supply of gas and electricity.

The board of directors could delegate some of its powers to one or more directors. In immediate compliance with this article, a Technical Committee was set up in 1891, composed of three members who were resident abroad, Leon Somzée, Breitmayer and Theodore Verstraeten, and one member of Portuguese nationality who was resident in Lisbon, Joaquim Pires de Sousa Gomes³⁰.

The Technical Committee functioned as an advisory body, being responsible for analysing and justifying the decisions to be taken with regard to the running of the company, especially from a technical point of view. It was also required to express its opinion on proposals for the appointment or dismissal of more senior employees and to fix their respective wages³¹.

The intervention of the Technical Committee, which was mainly composed of foreigners, is another example of the importance of foreign investors in the structure of CRGE. This Committee was essentially intended to function as an advisory body, but in practice it was given responsibility for the management of all the technical aspects relating to the company. The experience and technical knowledge that the members of the committee had at the level of the gas and electricity industries were in this way placed at the service of CRGE.

With the aim of keeping the Technical Committee permanently informed of the company's situation, the general manager was given the task of presenting the

³⁰ The engineer León Somzée, who had been appointed chief engineer of Sociedade Gáz Belga in 1867, was already responsible for the setting up of gas factories in several countries in which this company had invested.

³¹ AHFEDP, CRGE, Livro de Actas do Conselho de Administração, 1891-1893, fols. 5-6.

following elements to the board of directors in Lisbon: a fortnightly report on the company's situation with a forecast for expenditure over the next fortnight; a monthly report on the business undertaken in the previous month and a balance sheet of the accounts for that month. A copy of these documents was sent to Paris.

Since most of the members of this Committee were in Paris, most of the decisions of a technical nature were taken in this city, and whenever this was required by the complexity of the matters in hand, the general manager would travel to Paris to present the documents and discuss them personally. This was what happened, for example, in 1903, when it became necessary to take a final decision on the plans for the building of new electrical installations that had been presented by the engineer Neu and had already been approved by the board of directors in Lisbon³².

The day-to-day management of the company's business was carried out by a general manager, chosen by a minimum of two thirds of the members of the board of directors. He was responsible for implementing the decisions of the board, whose meetings he was entitled to attend in an advisory capacity, and for the management of all of the company's staff, proposing to the board the appointment or dismissal of managerial staff. He was frequently given responsibility for studying various technical matters designed to improve the conditions of production and the prices that should be charged for the supply of gas or electricity to private customers³³, decisions that were afterwards subject to higher approval.

The management of CRGE's factories was always placed in the hands of foreign engineers with technical training and experience gained in other gas factories and electricity companies. This option of contracting foreign engineers was due to the fact that until the end of the nineteenth century engineering teaching in Portugal did not include specific courses in the area of gas or electricity industries. Only in 1897 the Polytechnic Academy (Oporto) introduced a course of industrial technology, where a course on electricity and industrial chemistry was taught³⁴.

Only in 1911 the Instituto Superior Técnico (IST) (Technical Institute), the first Portuguese engineering *grand école*, was created³⁵. The IST, which director was the engineer Alfredo Bensaúde³⁶, embodied the new idea of a close relationship between engineers and economic development, mainly on an industrial

³² AHFEDP, Livro de Actas do Conselho de Administração, 1901-1907, fol. 97.

³³ The selling prices for public lighting were fixed, from the outset, by the contracts signed with the Lisbon Municipal Council, so that these could only be altered with the agreement of the council.

³⁴ The program of this course was based on Éric Gérard book's *Leçons sur l'Electricité*. This book was a sort of compilation of the course that Éric Gerard taught at the Montefiori Institut in Liège.

³⁵ The IST was a landmark concerning the training of Portuguese engineers, implementing a new technical culture based on high standards of evaluation both concerning students and teachers. The example of the IST was followed at Oporto by the creation of the Technical Faculty, in 1915. See Rodrigues (1999).

³⁶ Alfredo Bensaúde had, as a former student, experienced the modern training of engineers in Germany and after returning to Portugal he kept his interest in the German pedagogical and scientific model.

[154]

basis³⁷. The IST had a general course of two years; after this preparatory course, students could choose among 5 courses devoted to mining, mechanics, electricity, industrial chemistry and civil engineering. All the courses had theoretical classes and a strong practical component. The topics concerning electricity and electronics were taught by engineers with a large professional experience: Léon Fesch, had studied at the University of Liège and at the Institute of Montefiore and worked at the Siemens-Schuckert company and later on at the Gas and Electricity Company; Maximiano Gabriel Apolinário was also a former student at the University of Liège and at the Institute of Montefiore and worked at several private electrical companies³⁸.

Because many of the teachers of IST were also employed in the most important enterprises operating in Portugal the school was also a placement agency, which allowed the more talented students to find a job. Therefore, several students found their first jobs in companies somehow related to their professors, as for instance at the Telephone Company, the Henry Burnay & C^a (electrical division) and the Gas and Electricity Company (CRGE)³⁹.

In 1892, the foreign engineer Baptista Francesco Cruvellier, who had already belonged to Companhia do Gás de Lisboa and had been a member of its liquidation committee together with W. Pfizmayer, was appointed as the company's general manager. The contract that was established with this technician illustrates the importance of the position of general manager within the company⁴⁰. In 1903, Paul Collart was appointed general manager, followed by Jules Cordeveener in 1914. This post was of an eminently technical nature and was not connected with the ownership of the company, although the person who performed this role could have shares in the company⁴¹.

The presence of foreign investors and managers in this company made it possible to transfer to the running of a gas and electricity distribution network in Lisbon not only the technological advances that had been made at the level of the industrial operation of these services, but also the organisational models that had already been tried and tested at companies operating in various countries. Furthermore, specialised human resources were also mobilised from the pool of technicians associated with the foreign investors.

According to the articles of association, an attempt was made to ensure an equitable division of power between the Portuguese and the foreign directors,

³⁷ Until then Portuguese engineers were mainly civil servants, working on public works or on public administration. Diogo (2000).

³⁸ Matos (2006), pp. 193-195.

³⁹ Madureira (2002), p. 101.

⁴⁰ A five-year contract with a salary of 8.000 francs, 16.000 francs in bonuses, a housing allowance of 4.000 francs and the following benefits: an extra 1% on dividends below 3%, 1 ¼% on dividends of 3%, and thereafter a progressive percentage applied at the rate of an extra 1 ¼% for each 1% over this figure.

⁴¹ This was the case with Paul Collart, who in 1905 owned 100 shares in the company, a number that had risen to 250 shares by 1906.

with it being stipulated that their number should always be the same. In order to guarantee that both foreign and Portuguese directors intervened in decisions that might in some way commit the company financially, such decisions could only be taken with a minimum of two thirds of the votes in favour. This was the case with the negotiations that took place for the issue of bonds, the purchase or sale of loan securities or real estate, and for all contracts lasting more than a year or involving a certain amount of money. In the same way, decisions that were essential for guaranteeing the company's smooth operation also required a qualified majority. This was the case with the choice of the managing director and the general manager and the definition of their respective functions, as well as with the decisions about the alterations to be introduced at the factories or in the production processes.

However, the importance of the Paris office was decisive, in all the strategic decisions, as it was the case of financial matters or the entry of important shareholders. The discussion of the proposal presented in 1913 by Sofina to subscribe to 96.000 shares in CRGE is a good example. This proposal led to the holding of two meetings in Paris, which, in addition to the chairman, Verstraeten, were attended by the foreign directors, S. Propper, Emmanuel Propper, George Kohn, Jacques Monthiers, the chairman of the general meeting, the deputy chairman of the board of directors, Fernando Munró dos Anjos, two Portuguese voting members of that same board, the company lawyer, Pereira dos Reis, the director Deleury and the technical committee member Marcel Block⁴².

Therefore, from 1913 onwards, due to its position as the company's largest shareholder (holding 68% of the capital), Sofina was guaranteed the right to make decisive interventions in the company's management. Its entry into the capital of CRGE implied important alterations in the composition of the board of directors, since, from 1914 onwards, Sofina required that this body should include four directors that it itself had appointed. The directors appointed by Sofina were Dannie Heineman, Mariano de Foronda y Gonzalez, Georges Pavie and Rudolf Luecher⁴³. Its director, Dannie Heineman, also formed part of the Technical Committee. The other foreign companies acting as shareholders were relegated to the situation of portfolio partners. This at least was the situation experienced by Compagnie Générale Française et Continentale d'Eclairage par le Gaz-Gás Belga⁴⁴.

In 1913, when Sofina became part of CRGE, Dannie Heineman was appointed to the Technical Committee. In the following year, the war situation made con-

⁴² AHFEDP, Livro de Actas do Conselho de Administração, 1907-1915, fol. 239

⁴³ At the meeting of 26 February 1914, the members of the board of directors in Lisbon were informed of this decision. AHFEDP, Livro de Actas do Conselho de Administração, 1907-1915, fol.

⁴⁴ With the transition from gas to electricity the Gás Belga became a portfolio investor, as it did not try to actively participate in the electrification movement. Therefore, it lost their role as a major shareholder in several companies and became a minority financial investor. See Brion and Moreau (2005), p. 234.

[156]

tacts between Lisbon, Paris and Brussels difficult, which temporarily restricted the operationality of this body⁴⁵.

Over the years, the Paris office's control over the day-to-day management of the company's business was also guaranteed through the choice of the general manager and the heads of departments, most of whom were foreign engineers who had acquired experience in other companies from the same sector. In 1912, the engineer Miet was appointed as head of the technical department and Nandin as the head of the commercial department. Responsibility for the management of the manufacture of gas was given to the engineer Lievens. In 1914, Antoine Combet de Larenne, who for many years had managed the Madrid gas network, was chosen by the representatives of Sofina to take over the role of general manager of the company. Due to personal difficulties, Combet did not remain in Lisbon for long, and, as a result of his resignation in July 1915, the engineer Jules Cordeweener was appointed to fill the post.

The Paris office's control of the company was further guaranteed by the sending of technicians to Lisbon with the task of analysing the company's situation and drawing up reports. As an example, mention should be made of the visit that the engineer Cruvellier, who had previously held the post of general manager of CRGE, paid to Lisbon in March 1912 with the purpose of drawing up a report on the improvements to be introduced into the businesses operated by CRGE.

The fact that the post of general manager was always filled by foreign engineers, who had already gained experience with companies in the sector established in other countries, helped to increase the proportion of foreign technicians working at CRGE. In 1914, at the proposal of the general manager Combet, the following technical staff were hired: Manuel Brea, who at the time was deputy manager at the Madrid gas factory, was hired to perform the same role at the Belém factory; Ramon Ugart, the inspector of the gas meter service at the Madrid gas factory, was hired to manage the department responsible for the installation of gas meters; Girardin, who had run the electricity meter service for 13 years at the factory of União Eléctrica Madrilena, was appointed to the post of manager of the electricity meter installation service; Cunze was made responsible for the recruitment of new clients for the electricity service. This latter figure was not part of the company's staff and was paid the sum of 25 francs per month for his services on a contractual basis⁴⁶.

The decision to hire foreign technicians, in particular electro-technical engineers, was determined by the shortage of Portuguese technicians who were capable of performing these duties, as it was mentioned before, although such a decision was also affected by CRGE's international links. Thus, in 1908, when elec-

⁴⁵ For this reason, the General Meeting of 1914 reduced the number of members of this Committee, but on 10 June 1915, it was once again composed of four members, with foreigners enjoying a majority representation: Verstaeten, Propper, Heineman and Elio do Rego. AHFEDP, Livro de Actas do Conselho de Administração da CRGE, 1907-1915, fol. 238.

⁴⁶ Idem, fol. 219.

tricity production already represented a significant share of this company's business, the electrical engineer, Spire, was hired⁴⁷.

The entry of Sofina into CRGE also had effects at the technical level. Beginning in 1914, CRGE began a process of expanding its electrical installations, which was only completed in 1918, when the Central Eléctrica II power station came into operation. All the studies undertaken in relation to the building of new premises or the alteration of those already in existence were undertaken by this company in return for the payment of overheads for the financial or technical services rendered. Overheads amounted to 6% of the amount spent on the work undertaken.

At the same time, Sofina received an overhead of 1½% of the value invoiced for the material that was purchased to equip the new factories or to renew the equipment of those already in operation. Its intervention also extended to the appointment of the technician who was to manage the work involved in the installation of the new factories⁴⁸.

By acting in different European countries, the large-sized companies engaged in building gas and electric engines or involved in the running of factories that produced these energies, favoured the circulation of engineers and other technicians in the European area. Through their intervention in the industries and teaching establishments of the various countries, these men contributed to the standardisation of technical knowledge and procedures. Thus, the study of the professional careers of these engineers can contribute towards our knowledge of technology transfer and the technological options that were taken in each country over time⁴⁹.

5. Conclusion

As it was the case of the Paris Committee in the Companhia Real, the CRGE's Paris office not only intervened in the strategic management of the company, but also in the operational management. The responsibilities and powers attributed to the "foreign head" of the bicephalous directive structure assured the property rights of the major foreign shareholders of the companies and tried to overcome the agency problems referred at the beginning. The Board of Directors in Lisbon ended up having a diminished importance, formally approving decisions taken in Paris and monitoring the day-to-day management. However, a distinction is evident when we look at the formal existence of this bicephalous management structure. In the case of the Companhia Real, the Paris Committee had a formal statute in articles of association. The CRGE's Paris office only had an informal statute.

⁴⁷ He was paid an annual salary of 8,000 francs. AHFEDP, Livro de Actas do Conselho de Administração, 1907-1913, fol. 27.

⁴⁸ If the works to be undertaken required the continued presence of an official from Sofina, CRGE would bear the cost of this expense, as well as the travel expenses and the cost of setting up an office, AHFEDP, Actas do Conselho de Administração, 1907-1915, p. 243.

⁴⁹ On the importance of engineers in technology transfer see Matos (2006) and Williot (2006), pp. 216-218.

[158]

Moreover, the relation between foreign shareholders and Portuguese ones is more balanced in CRGE, as it was mentioned before. The reason for this difference may derive from the peculiar creation of CRGE, merging two existing companies: one Portuguese, operating in Lisbon for half a century (Companhia Lisbonense de Iluminação a Gás); another, dominated by foreign investors and recently created (Companhia Gás Lisboa).

However, in practice, both administrative structures ended up recognising the importance of the board of directors based in Paris, which represented the foreign shareholders. Such importance could be seen at various levels of their activity. Firstly, it involved the effective formalisation of the Paris office as an integral part of the company's organisational structure. A second aspect to be noted was the fact that the post of chairman of the board was always filled by a foreign director living in Paris. A third aspect was the fact that, although summaries of the meetings of the board of directors held in Lisbon were sent to Paris (after translation), the executive director travelled regularly to Paris to present the situation in which the company found itself in greater detail, and to discuss the various decisions that needed to be taken at the financial or technical level.

The most important issues relating to financial matters were dealt with in Paris, with one or more Portuguese directors travelling to that city. On the other hand, the chairman of the board travelled to Lisbon on a regular basis, particularly when it was necessary to take measures aimed at introducing a profound restructuring of the local management system or the enlargement of the factory premises. Finally, technicians were sent to Lisbon in critical situations in order to assess the company's situation.

This article highlighted the fact that this type of investment was very far from the characteristics of a portfolio investment, as far as the control of the company is concerned. The Paris Committee or the Paris office exercised control not only over the strategic management, but also over the operational management of both companies.

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[160]

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[161]

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