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Technological dependence, captive market and outsourcing in the Spanish telecommunications equipment industry Angel Calvo (UB)

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ABSTRACT

This article addresses the complex relations between the expansion of multinationals and economic nationalism in Southern Europe during a period of industrial crisis, growing economic integration and intense technological change, all amidst a notable alteration of the regulatory framework. The paper focuses on the process of global restructuring of the telecommunications industry in the two final decades of the 20th century and the first years of the new millennium. The period encompasses the transition from an industry based on the close linkage, if not strict integration, between the monopoly of the telephone service and the national telecommunication equipment industry. Methodologically, it is based on a case study - that of the International Telecommunication and Electronics Company -, on an interdisciplinary approach and on varied sources. The article reveals the factors behind the transformation of a vertically integrated company into one that outsourced its production before being engulfed by the globalized economy. It also highlights the role of international markets and, more specifically, the Latin American market.

Keywords: Technological dependence, captive market and outsourcing, Spanish telecommunications equipment industry, Angel Calvo (UB)

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Introduction

The boost to the production of telephone equipment preceded the launch of the general development plans and was the result of the incentives provided by the Franco regime for industrial location and, more specifically, of the combined action of the Malaga Plan and the pro-industrialisation board of 1959 - the Socio-Economic Development and Industrialisation Board of the province of Malaga - created to encourage the establishment of industries through financial aid and non-refundable subsidies. This combined action has resulted in several companies in different sectors, including Intelhorce, the butane bottling company and the North American company of chemical industry Amoníaco Español.

However, the characteristic of the province of Malaga was the appearance of a productive bisectorial specialization, made up of tourism and telecommunications, the so-called "clean industry". This reality bears the names of SECOINSA, Fujitsu, Siemens, Hughes Microelectrónica, Isofoton, SECOTON and the Compañía Internacional de Telecomunicación y Electrónica S.A. (CITESA, from now on Citesa), protagonist of this study¹.

The issue is framed by the five successive economic plans that Andalusia had during the autonomous period. We refer to the Economic Plan for Andalusia (1984-1986); the Andalusian Economic Development Programme (1987-1990); the Andalusian Economic Development Plan (1991-1994); the Andalusia Horizon 2000 Economic Plan (1998-2000) and the Andalusia XXI Century Economic Plan (2002-2005).

The fundamental merit of this study lies in the analysis of the trajectory of a company belonging to a sector to which economic and business historians have paid less attention than that afforded to aggregate industrial processes or similar episodes that occurred in the steel and naval industries².

During the years and in the sector that we are dealing with, the restructuring of INI's electronics

division, of the American giant IT&T and of Telefónica's industrial holding, as well as the integration of private and public companies to create a solid defence industry (Indra), stand out. All of them deserve specific attention due to their peculiarities and some have already been addressed³ or there's evidence that they're being so in other places⁴. The case of Citesa is one of the smallest in terms of volume of employment and production.

Methodologically, the work has an eminently descriptive character. It aims to join the effort to illustrate the interaction between the global investment strategies of multinationals and the policy carried out by the nation state in the host country. Within this framework, it introduces a significant nuance since it extends to the local interlocutor - the government of the nation state - other new ones - the autonomous government and the trade unions⁵. The study looks at the understanding of the global shaping process of the telecommunication industry in the two final decades of the twentieth century and the first years of the new millennium. The period encompasses the transition from an industry based on the close linkage, if not strict integration, between the monopoly of the telephone service and the national telecommunication equipment industry. The study is structured in four main sections, which successively address the origins and evolution of Citesa, the crisis and restructuring, the company in the face of market globalization and the strategies adopted in the face of the global market.

Citesa was promoted by national and foreign investment, following a collaborative scheme between industry, the State and the banks. The capital of 250 million pesetas was contributed in half by IT&T, in a fifth by Standard Eléctrica, in 15 % by Marconi Española, incorporated into INI, in 10 % by CTNE and in the remaining 5 % by the Hispano Americano and Urquijo banks, part of the initial financial core of CTNE. This shareholding changed after a while, when in 1968 CTNE acquired 10 % of the shares of

Cytessa at a rate of 125 %; in 1971 control of the company passed to the group integrated into Intelsa, a subsidiary of the Swedish multinational Ericsson. At the beginning of the 1980s Cytessa's capital structure was dominated by SESA with 56 %, followed by CTNE (31 %) and completed by a group of shareholders, predominantly banks⁶.

The above leads us to point out that Cytessa belonged to the IT&T group in Spain, composed of two other companies that covered different specialties in the telecommunications equipment industry, according to a strategy of plant division. They were Standard Eléctrica and Marconi Española, manufacturers of telephone and communications equipment in general⁷. Its production, based on technology of US origin, was primarily intended for the domestic market and, in particular, for Telefónica. By 1981, Cytessa produced 11 % of the telecommunications equipment industry in Spain, a percentage which fell far short of SESA's 61 %⁸.

Cytessa's industrial activity began in 1964, when the new telephone equipment factory was set up in Malaga, which broke with "a flat landscape in Malaga's telecommunications", according to one of the protagonists. The choice of the location of the telephone terminal factory in this southern province was due to two reasons: the first one, the existence of the port as an exit point for exports and the second one of a sentimental nature. Its production per hour reached one thousand pieces according to the chain system, subject to automatic control, and two hundred devices⁹.

This was followed by years of upheaval between 1969-1972 and crisis in the middle of the decade. In comparative terms, Cytessa was in the range of the recently appointed Spanish Marconi and slightly below companies from other sectors, such as Cristalería Española, Solvay or the Sociedad Metalúrgica Duro Felguera¹⁰.

In short, Cytessa distributed its production in the centres of Madrid and Malaga, which were added to rented establishments. In addition to the factories, it had a commercial division to sell

data and text terminals imported from the USA and Europe, which was the result of IT&T's strategy of importing products for which there was insufficient demand to justify their manufacture in Spain¹¹.

In the beginning, Cytessa was in substance a factory with a manufacturing process that completed the vertical integration derived from the close linkage with the monopoly telephone service operator. The integration with the market led to a reduction in transaction costs and commercial structures. The company also had an R & D or development engineering section, which was in practice responsible for preparing the documentation for the equipment to be manufactured, transposing and translating the original equipment documentation, usually from IT&T's Belgian subsidiary¹².

In fact, at first the development engineering was kept at the Standard Eléctrica plant in Madrid, with which a correspondent in Málaga was coordinated to guarantee the proper functioning of the R&D. Malaga only had an electro-acoustics and telephonometric measurement laboratory, created by Lorenzo Martínez, which was necessary to control the measurement equipment and certain technical characteristics of the manufactured telephones.

Towards 1967 and within the framework of a reorganization of the R+D, IT&T divided the responsibilities in audio communications between a European and a worldwide section, based in Brussels and New York, respectively. After visiting the establishments in Spain, the R+D directors for Europe and the rest of the world decided to move the audiocommunications R+D to Malaga and put it under the direction of Lorenzo Martínez, who came from the assembly workshop, of which he was head. This is where the creation of the actual R+D department in the Malaga factory begins, which is indispensable, along with the size, for access to the university-company agreements of the National Plan or to the R+D programs of the EC, generally with several participating countries. Both circumstances -

size and R&D - coincided in Alcatel Citesa, unlike other large companies, which, like Siemens, practiced an enclave factory strategy and incorporated late R&D located in the region and established connections with the University¹³. Experts rank Alcatel Citesa among the subsidiaries of multinationals that restricted their innovative activity to adapting or developing basic research carried out at the group's headquarters. To this category belonged the activities of technological development, engineering and telephone design¹⁴.

The factory evolved by incorporating new sections, among which the electronic design laboratory and the marketing department stand out, the first of which was fundamental in providing the factory with technical resources on board that would give it a certain autonomy and would make it less vulnerable even to another company in the group in order to avoid displacement of manufacturing. Around 1980 some activities began to be externalised according to the outsourcing model, which affected the press, plastics and tooling workshops¹⁵. In addition to the production activity, it had a small resale activity with the aim of exploring the market for future technologies, i.e. equipment used directly by the end user, such as data terminals, teleprinters, facsimiles, intercoms and pagers¹⁶.

Over time, a certain division was imposed between what could be defined as network products and user products. The configuration of the former, the basics of a country, fell directly on the State. Citesa's mission was to supply this segment of end users as a counterpoint to the network subsector, which the State traditionally entrusted to Standard Eléctrica¹⁷.

Conceived to manufacture exclusively telephone equipment for export, Citesa soon changed its orientation, to the extent that, in the first half of the 1970s, an almost flat international market was compensated by a certain dynamism in domestic sales¹⁸.

Since the CTNE decided to extend its supply of terminals and equipment to second suppliers,

Citesa has been selling PABXs, known as switchboards, to end customers, partly marketed through Cosesa and partly directly, to official agencies, ministries and government services. They exported directly either using their own agents, IT&T subsidiary companies or their own commercial services.

Citesa had its primary specialization since its inception in the switching and installation of peripheral equipment for Telefonica, mainly telephone exchanges and various varieties of telephone equipment, from the very simple and traditional to the most complex. The Heraldo model, an important modernity leap in Spain that displaced the classic bakelite models, responded to Telefónica's requirements for the future. The original model was manufactured in Stuttgart by Standard Electric Lorenz, a German subsidiary of IT&T, although it was soon copied in Antwerp by Bell Telephone Manufacturing Co. another IT&T subsidiary. Telefonica took this model as reference. At the end of 1961, Citesa sent telecommunications engineers to Antwerp for a stay of several months to study the manufacture and carry out quality control, as well as to check the operation of a telephony laboratory similar to the one planned in Malaga. The tools for this first Heraldo model were manufactured in the Netherlands and Spain. To check that the design was correct, while the new factory was being built in Málaga, 20,000 devices were completed at the headquarters in Madrid¹⁹.

One of the most emblematic terminals, Teide, was designed completely by Citesa technicians together with the Telefónica development department that acted as a guide. The Gondola model consisted of a copy of the "Trimline", manufactured by Western Electric for ATT. Citesa, at the request of CTNE, manufactured this telephone for the Spanish network from 1970 and exported it to more than fifty countries.

The design of models such as the Dome or the coin operated phones, destined for Telefónica or Latin America, was done in the R&D department of Citesa in Malaga. Citesa manufactured the

Forma devices in their different versions from a design of Interisa, and developed the whole range of public telephones, as well as the first generations of analogical wireless CT0 and the European digital standard DECT (Digital European Cordless Telecommunication)²⁰. Already under the aegis of Alcatel, from very early on Citesa seemed to have a position in the conquest of European markets from specific niches. Through Alcatel Citesa, the multinational negotiated an alliance with the British Amstrad PLC in a joint venture for the manufacture of a range of telephones initially intended for the national market through the commercial network and then for the whole of Europe. The Alcatel Citesa plant in Malaga would house the production of wireless and mobile phones, which would increase to tens of thousands of units. Amstrad PLC, which had an extensive distribution network, effectively created a subsidiary in Spain and acquired its distributor Indescomp²¹.

Let's take a look at these latest technologies. Citesa added in 1989 to its commercial offer the CTO phones, designed and manufactured by a company from the Republic of China. From this commercial platform, it acquired the necessary capacities for the development of the technology and gradually integrated the manufacturing in Malaga. For its part, the arrival on the market of the first digital DECT wireless terminals - called in other countries such as the United Kingdom CT2 (Carr et al., 2001, p. 342) - intended for residential use dates back to 1996 and did not give rise to significant sales until the following year. Analysts thought that the heavy investment needed to develop DECT technology would raise a barrier to entry into Europe for a time for Asian companies. However, not only were Asian companies present in the residential market for that range from its inception, but most European companies in the sector began to brand products manufactured in that area. The reason for the change was precisely the need to quickly recover the continuous investment made by the integrated circuit companies that developed the

basic technology for DECT (Philips, etc.). As a result, they provided Asian companies with access to these components and even to product design know-how. In these circumstances, Alcatel Citesa decided to postpone the production of DECT phones for the residential sector as the price resulting from their local manufacture made it impossible to compete in the market²².

Crisis and restructuring of Citesa

Beyond the start of the industrial trajectory, the years between the end of the 1970s and the beginning of the following decade provided indications of different signs within a general trend of crisis, as can be seen in the case of Standard Eléctrica S. A. Citesa's total sales fell by 36 million pesetas from 6,086 in 1978, to 6,050 in 1979 (435 million exported to Algeria, where the company shared leadership with SESA in telephone terminals) but grew by 1,163 in 1981 (with exports of 1,335). The workforce grew from 3,413 at the end of 1978 to 3,301 the following year and 2,500 in 1981. In the losses presented in 1980 - some eight hundred million pesetas - Citesa took refuge to show the absurdity of clinging to some of its sections, which openly competed with Standard Eléctrica, and the need to restructure its activities and dimensions²³.

In this context, some data point to a growth of Citesa, such as several extensions carried out in the factory located in the Parque Tecnológico de Andalucía in Málaga (PTA). These expansions affected its occupied surface area, its workforce and its production capacity, which were multiplied by 2.6 from 10,000 m², by 5.37 from 465,000 telephones and by 5.36 from 405 employees, respectively²⁴. Nevertheless, in 1982, IT&T clearly revealed its plans for integration, which would take place on July 20 and would lead to the closure of the Antonio López establishment in Madrid and the transfer of the bulk of its activity to Toledo. Some of the staff were offered to join Toledo without touching the working conditions they had and the rest

waited for the results of the IT&T group's negotiations²⁵.

After four months of negotiations on a Redundancy Program presented by Standard Eléctrica, IT&T broke off the talks with the announcement of the termination of the contract of the whole group in Spain - SESA, Marconi and Citesa²⁶. For its part, the official bodies were already talking openly about investments for conversion

Citesa suffered from an extremely fragile capital structure, with a bank debt/equity ratio of around 77/23. The loans amounted to some 2,500 million pesetas and were distributed among fifty banks, including all the major ones. One of the company's main objectives in the immediate future was to strengthen this financial structure in order to distribute the financial charges, which were a burden on the profit and loss account²⁷.

In 1983, SESA absorbed Citesa, which at that time had maintained the level of employment of two years previously and 7,213 million pesetas in sales, 18.8% of which were abroad²⁸. The takeover reflected the logic of rationalisation of those then associated with IT&T through the integration of production specialities and the elimination of operational and labour costs. The Malaga factory was transferred to SESA's Audiocommunications division and the Madrid factory was soon closed and moved to the historic Ramírez de Prado plant, which also housed the bulk of the workforce. The rationalisation of the production system proposed by SESA meant that Citesa was integrated into the IT&T subsidiary. SESA would have to meet the cost of restructuring Citesa through voluntary redundancy and early retirement, among other actions²⁹.

The central event of the telecommunications industry in Spain at the end of the 1980s and beginning of the following decade occurred when the French energy sector company Compagnie Générale d'Électricité (CGE) created Alcatel N. V. from the European subsidiaries of the North American multinational IT&T. Alcatel Standard Eléctrica S.A. was then

created, and later renamed Alcatel España S.A. From an organisational point of view, Alcatel replaced the structure it had inherited from IT&T, based on geographical areas, with another based on product lines. The factories in Malaga and Madrid were thus inserted into the new Business System Group. At the start of the 1990s, Alcatel España S.A. was formed by the following companies: Alcatel Standard Eléctrica S.A., Formación y Consultoría S.A., Alcatel Cable Contracting S.A., Alcatel Citesa S.A., Alcatel Ibertel S.A., Alcatel Espacio S.A. and Alcatel Sistemas de Información S.A.³⁰

Citesa was coping with several simultaneous factors that were bringing about substantial changes in the factories. The first refers to the relentless technological change, mentioned elsewhere, which accelerated, automated and reduced the requirement for labour, while altering the composition of necessary materials. To this was added the application of computer technology in the design area with auto-cad systems, which caused a surplus of draughtsmen and other technicians, and to the offices³¹.

In the profound and rapid technological change gravitates a primary thread of our story. The digitalization of equipment reduced the need for personnel and, therefore, caused a surplus of labor while requiring different human, technical and industrial resources. Thus, for every sixteen hours needed to manufacture an electromechanical switchboard, three hours were needed to manufacture an electronic one³².

The crisis that swept through basic sectors of industry imposed a specific approach and the adoption of industrial reconversion policies, in order to achieve the rationalization of production processes and their adaptation to the demands of economic and technological development and to market conditions. The Government promoted a regulatory framework, which gradually established measures including tax, financial and labour benefits³³.

The general framework of the Government's industrial policy in its horizontal promotion facet was set by the Ministry of Industry, Trade and Tourism by promoting different aid programmes (Industrial Technology Action Plan -(PATI)-, Quality Plan, Spanish Business Support Internationalisation Plan, Industrial Design Plan, among others). The PATI aimed to promote technological innovation in companies, through subsidies and grants for R&D projects, serving as a framework for various specific plans, including the National Electronic and Computer Plan (PEIN III), whose main objective is to stimulate development in the field of information technology. For its part, the Centre for the Development of Industrial Technology (Centro para el Desarrollo Tecnológico Industrial, CDTI), sought to stimulate technological development in the industry by means of preferential credits. In addition, three plans were launched, which sought to boost development in the areas of software, robotics and automation and microelectronics with national and European Commission funds³⁴.

On the basis of the above regulatory framework, although without being specifically named since it belonged to SESA, Citesa was included in the controversial industrial conversion plan of the IT&T group in Spain by an agreement between the main parties involved, i.e. the State, the trade unions and the company. It had a twofold market and employment objective: to regain market shares in new electronic switching products and to secure as many jobs as possible³⁵. The application of the plan brought with it the files of employment regulation and a drip of leaves in the staff by means of compensated leaves and some early retirements supported by the Social Security³⁶.

By 1988, Citesa was openly immersed in a process called business restructuring³⁷. In the middle of the following year, the multinational Alcatel decided to separate Alcatel-Citesa from the Alcatel-Standard Eléctrica, S A. group in order to create a factory dedicated to the design, manufacture and sale of a wide range of

products with the aim of responding competitively to the liberalisation of the market with an appropriate production infrastructure and degree of specialisation. In the middle of the following year, the multinational Alcatel decided to separate Alcatel-Citesa from the Alcatel-Standard Eléctrica, S A. group in order to create a factory dedicated to the design, manufacture and sale of a wide range of products with the aim of responding competitively to the liberalisation of the market with an appropriate production infrastructure and degree of specialisation³⁸. In order to carry out the project, the French multinational signed, this time with the unions against it, a plan in which the actors involved made a series of commitments, which were subject to the vigilance of a monitoring committee with a plural composition. The company undertook to present an industrial plan that contemplated diversifying production with the incorporation of new products and maintaining a workforce of a thousand workers in Malaga at the end of 1991. This plan included a commitment to purchase products by Telefónica, subsidies, bonuses and exemptions by the State.

Within the framework of the sector's reconversion plan, the Government sought to maintain and consolidate the existing industrial base at the Malaga subsidiary of the Alcatel Group through ongoing measures to promote and consolidate a range of products. At the same time, it was pushing the company towards measures aimed at ensuring its competitiveness, modernising its products and guaranteeing employment³⁹. In the view of external observers, the central government has adhered to the agreement, disbursing more than 20 billion public money in the form of grants, subsidies and exemptions. Telefónica did the same in part, contributing to the significant benefits for the Alcatel Citesa group. However, within a few months of the deadline, the company had failed to deliver on its promises, at least in part, although it had managed to diversify production with heavy investment. But

the manufacture of new products related to the digital plants clashed with a temporary drop in demand, which called for a programme of employment regulation⁴⁰. The Malaga plant entered fully into the global relocations and became a centre for the assembly of material imported directly from Southwest Asia, mainly from Taiwan, and even for the labelling of these products. The factory in Malaga suffered a progressive and continuous dismantling, which fed the subcontracting of production abroad and, with it, precarious work, the underground economy and deregulated labour relations⁴¹. The R&D department, which was crucial to the company, underwent a similar fate as it was broken up and its staff - 67 technical and administrative - was halved, overwhelmed by a low order book that prevented it from absorbing the high costs and threatened to make the products it manufactured more expensive. In other words, some moved directly to manufacturing engineering and the rest to development engineering. In response to this management measure in Spain, the parent company Alcatel imposed the segregation of R&D from Paris, which became directly dependent on France. Without technicians or means for its development, the factory in Malaga was forced to an unflattering fate. Alcatel was quick to announce to the trade unions the objective of reducing the workforce by 200 workers and to stop manufacturing telephone terminals. Citesa was threatened with being reduced to a mere packaging centre for products imported from Taiwan, to become a sales department for the sale in Europe of imported telephone products in their entirety or a mixture of both⁴².

In short, the crisis at Citesa worsened following its takeover by Alcatel NV to create Alcatel-Citesa and the extension of the Group's conversion to 1991 under the terms and conditions of the previous one⁴³. The new agreement that extended the previous plan called "Reconversion Plan Adjustment" covered two income plans that affected the over-50s. As

a result, massive departures of personnel, estimated at 1,400 workers in a 10-year period, left a theoretically restructured Citesa with a staff of some 320 people.

Citesa in the face of market globalization

Now let's get the story of the process and its roots. Alcatel Citesa's ills were based on inadequate facilities and equipment, a heavy staff structure and a lack of financial resources to cope with the undelayable reconversion. This company faced the critical situation with a strategy based on taking advantage of the commercial, technical and industrial possibilities offered by the Alcatel group of companies, the demand and the new framework of the European single market. This strategy took shape in the 1993-1998 Feasibility Plan which was gradually reached⁴⁴.

In the last quarter of 1991, the company launched a redundancy programme and began a period of consultation with a view to reducing 234 jobs. The company, the workers' side - workers, works council and trade unions - and the regional administration as mediator negotiated solutions to the situation. From this bargaining step, a generic agreement was reached that contemplated the reduction of the aforementioned volume of employment on a voluntary basis. The agreement, signed before the Ministry of Labor on December 3, 1992, involved compensation, early retirement for workers over age 55 and voluntary transfers. However, the company, which was beset by losses, submitted a viability plan with the dual commitment of ensuring the maintenance of the workforce and promoting a new industrial project. The second aspect of the commitment involved the manufacture of a line of products related to wireless telephony, with advanced technology and high demand. The activity was to be located in the Andalusia Technology Park and the plan described would require investments of ten billion pesetas, the bulk of which - 60% - would be allocated to R&D, for the development of this product. After several meetings between the company and the

Andalusian government -the Ministry of Economy and Labour-, the aid of the Andalusian Government for the implementation of this project was studied and proposed, subject to compatibility with the competition rules established by the European Economic Community. The aid would be complementary to the regional incentives from the central government. For its part, the company would ensure the maintenance of the jobs and the installation of the modern factory in the Parque Tecnológico Andalucía⁴⁵.

Part of the investment effort was made by Alcatel Citesa itself, which contributed its own resources. Self-financing more than tripled between 1993 and 1998, from 1 009.4 million current pesetas to 3 350.3 million. Citesa benefited from subsidies from central and regional government agencies, although it is true that there were notable differences between the amounts granted and those finally approved. The final amounts of the subsidies approved were 1,594,250 million pesetas from the Ministry of Industry and Energy and 1,553,075 from the Autonomous Community Government of Andalusia. As regards the composition, four fifths of the amount from the Ministry was allocated to tangible assets and the rest to R&D, while the Andalusian Regional Government further strengthened the percentages of tangible assets⁴⁶. % for transfers of assets, 6.94% for the purchase of land and the rest for capital increases. Between 1994 and 1996, the Centre for the Development of Industrial Technology granted Citesa long-term loans for the partial financing of R&D projects amounting to Ptas. 504.9 million. Finally, in 1994, the Instituto de Fomento de Andalucía granted loans to Citesa for 50 million pts. to finance two specific projects (Autoscam and Clarm)⁴⁷.

In addition to what has been said about government subsidies, we must add that part of the financial effort of the implementation of the viability plan fell on other shoulders. The parent company Alcatel España granted its subsidiary

Ptas. 2,720 million in 1992, and it also obtained bank loans of Ptas. 2,819 million.

It is clear that the company suffered from an extremely weak financial structure, a situation which the viability plan sought to correct. Serious progress was made in this direction with the contribution of Ptas. 7,095 million made by the shareholders in 1993, the capital increase of Ptas. 200 million three years later and the increase in reserves with the injection of undistributed profits⁴⁸.

Despite the optimism displayed by the company, some figures on the financial structure are at least thought-provoking. The first surprise is the fall in share capital - 3,005 million pesetas in 1992 to 1,220 in 1998 - and the small increase in net tangible fixed assets - 2,669 million pesetas compared to 2,673. It seems logical that the restructuring reserve should have been drastically reduced - PTA 2 151 million in 1992 and PTA 289 million in 1998. The percentage of assets over sales fell from 113.8 to 70.6, and the percentage of working capital fell from PTA 1 951 million to PTA 1 323 million in 1992-1998, from 16.3 % to 9.4 %. The drastic reduction in restructuring costs weighed heavily on Alcatel Citesa's cost structure and involved an increase in the percentage of production costs. However, in 1998 the cost structure showed a significant improvement as the ratio of production costs to increasing sales had decreased⁴⁹.

Citesa boasted that it had met the three main objectives of the industrial plan for the period 1993/1994, namely the construction of a new factory, the acquisition of the equipment necessary for the manufacture of radiofrequency equipment - in particular the abovementioned DECT technology - and the modernisation of equipment and manufacturing methods. The figures seem to support this, especially in R&D expenditure, which increased eightfold, but less so in R&D personnel, which remained relatively stable between 1993 and 1998. Between 1993 and 1998, Alcatel Citesa invested in R&D nearly 4 billion pesetas, with an annual distribution per line of projects as shown in the Graph 1.

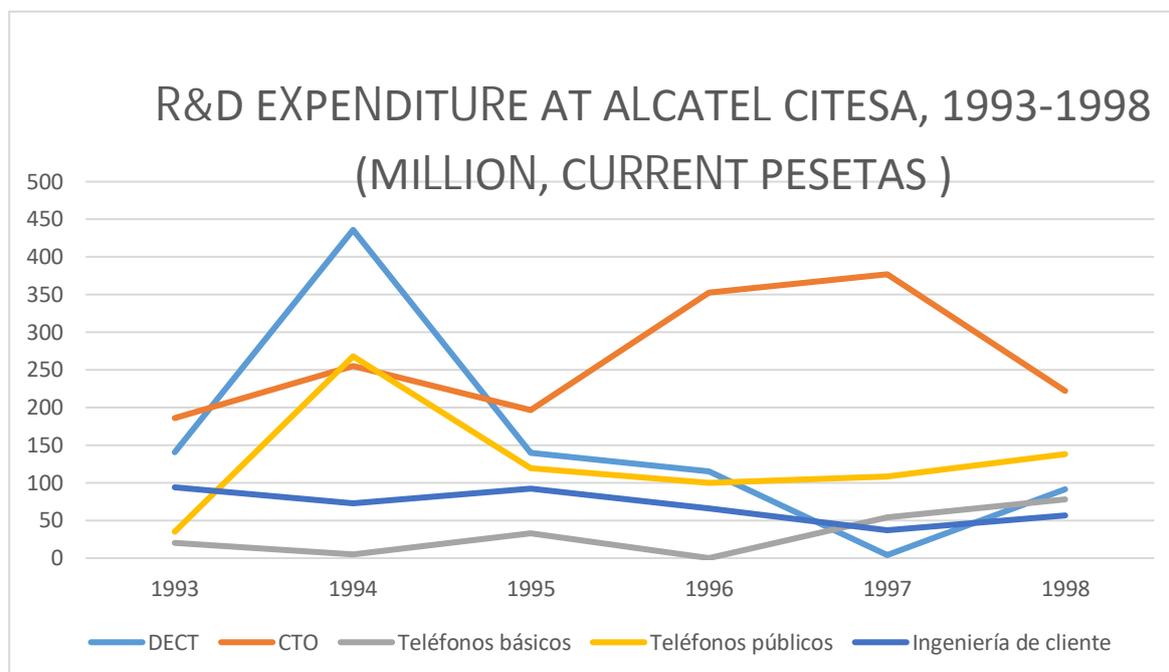


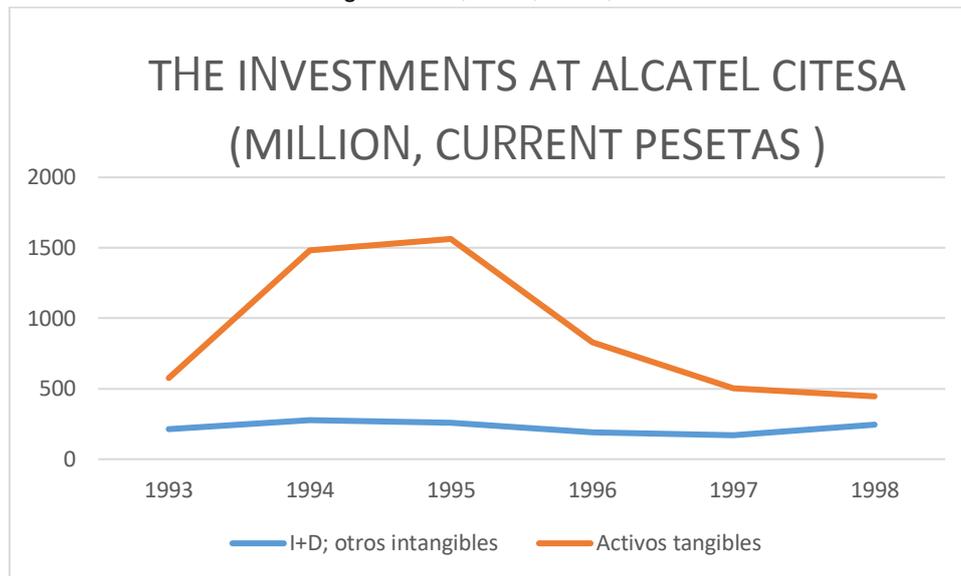
Table 1. R&D personnel at Alcatel Citesa, 1993-1998

	Number					
	1993	1994	1995	1996	1997	1998
Graduates	17	20	19	19	17	18
Middle-level graduates	14	14	14	14	14	14
Technicians	11	11	11	11	11	11
Administrative	1	1	1	1	1	1
Total	43	46	45	45	43	44
	Percent					
	39,53	43,48	42,22	42,22	39,53	40,91
	32,56	30,43	31,11	31,11	32,56	31,82
	27,82	25,30	26,05	26,05	27,82	26,89
	2,33	2,17	2,22	2,22	2,33	2,27
	100	100	100	100	100	100

Source: Based on Alcatel Citesa (1999), p. 13.

Following a cooperative scheme, since the beginning of the gestation of the DECT standard Alcatel Citesa actively participated in the European bodies that defined and developed the standards of that technology in the EFTA (European Free Trade Association) and in the ETSI, which developed the pan-European standards. Alcatel Citesa developed the technologies required for DECT products during

the years 1993 and 1994 in collaboration with the research laboratories of Alcatel Spain in Madrid. In addition, it carried out more than fifty technological projects in collaboration with the University of Malaga at a total cost of more than ninety million pesetas⁵⁰. The Graph 2 shows the investment effort in R&D and other intangibles, which represented four fifths of the total for the years 1993-1995.



Fuente: Elaboración a partir de Informes de auditoría, Arthur Andersen, 24 de febrero de 1999, p. 2.

Citesa combined a concentration on the key manufacturing activities - assembly of components on printed circuit boards-, final assembly of apparatus and their final testing- with the outsourcing of activities that were not specific to manufacturing and whose volume did not justify in-house production - manufacture of printed circuit boards, injection of plastic parts or repair of apparatus. Carrying out the outsourced activities with quality assurance and final production control required agreements with preferred suppliers. With the investment in fixed assets carried out between mid-1993 and the end of 1998, estimated at more than five billion pesetas, the company was equipped with the necessary equipment, facilities and machinery for the production of high-technology telephone terminal equipment⁵¹.

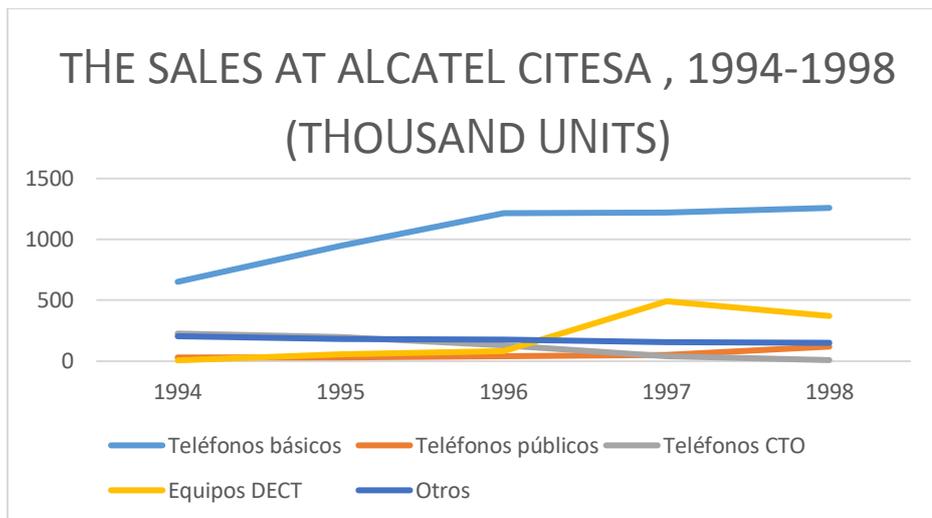
Besides this triumphalist forecast, let's see the bases of its productive system through the analysis of several variables related to the Malaga factory in 1998⁵². This factory produced telephone terminals with machinery of mostly national origin (1,070.738 million pesetas out of a total of 1,331.955). In the structure of fixed capital the predominant item was formed by machinery and installations with almost half of a total of 1,331.955 million pesetas. If other equipment investments are added, the figure

rises to almost 70% of the total. Land and plots of land accounted for 14.44% and industrial buildings plus other constructions for 15.85%. The production figures show a bleak picture. The Malaga plant produced an estimated annual value of PTA 6 896 million, which was mainly made up of equipment, goods and assemblies (47.71 %), electronic components (28.28 %), and parts and fittings (23.13 %). If we talk about the cost of production of Citesa Alcatel (millions of pesetas), supplies (61.62%) and staff costs (16.11%) exceeded three quarters of the total. Other operating expenses (15.70%), provisions for depreciation of fixed assets (4.05%) and variations in operating allowances (2.52%) made up the remainder. The production of the Malaga plant was mainly destined for the Alcatel Group itself, with more than half of the sales (the parent company 44.89% and Alcatel Spain 6.61%), followed at a distance by customers outside the group (24.50) and public authorities (23.94%).⁵³

If we consider the results of the viability plan, the sales figures increased by a factor of 1.7, from 1,124 thousand units in 1994 to 1,909 five years later. Over the five-year period, there was a gradual shift towards the foreign market, so that by 1998 the weight of sales on the domestic market and those abroad had levelled off. A

breakdown of sales shows the clear predominance of basic telephones, well above DECT handsets and terminals, but especially

analogue CTO handsets, one of the company's strongest bets (Graph 3).



Source: Based on Alcatel Citesa (1999), p. 12.

In the delocalization plan that forged the Alcatel NV parent company, the Malaga plant was confined to the manufacture of a key product - the exchanges. It was also to become the manufacturer of a series of equipment for Alcatel customers throughout Europe, including low-capacity exchanges and telephone sets of various kinds. Alcatel breached the commitment by completely excluding key products such as basic telephones and part of the exchanges⁵⁴.

Durante el periodo del plan de viabilidad la plantilla de Alcatel Citesa se mantuvo relativamente estable en cuanto a su número y a su composición. Tan solo resultó notable el aumento del peso de los titulados medios.

During the period of the viability plan, Alcatel Citesa's workforce remained relatively stable in terms of numbers and composition. Significantly, only the increase in the weight of the average graduates was noteworthy.

Alcatel Citesa manufactured for Telefónica the regular stand-alone coin-operated telephone (Teléfono regular de monedas autónomo, TRMA), which was particularly suitable for intensive use and was launched on the market in 1991. The same formula was applied when Alcatel Citesa and Abecomsa were awarded the

contract to manufacture the Network Connection Point with Telemetry Module (Punto de Conexión de Red con Módulo de Telemidida PCR-T/M). Alcatel Citesa, together with Amper Telemática, assumed the manufacture of the Forma 1 device, subject to contract⁵⁵.

Citesa had been present from the beginning in a professional telephone market with Telefonica's Satai systems. This professional market was also fed by the corded telephones, associated with exchanges, manufactured and marketed under the Alcatel brand. Citesa was forced to compete with other factories of the group, including Illkirch. Malaga found a ball of oxygen with the allocation of the manufacture of U.A. phones, a range of which came to manufacture several hundred thousand a year. However, the plans of the Alcatel parent company went through centralisation. The multinational started in 1991 a project to concentrate in a single factory all the production of basic phones scattered throughout Europe⁵⁶.

It is known that Citesa led within the Alcatel group the take-off of the wireless telephones, both in the analogical technology CTO and in the DECT technology, this developed inside the Group by Citesa, Alcatel Standard of Madrid and

Alcatel SEL of Germany. In this type of telephone terminals Citesa acted in a combined way between departments of the company - marketing, engineering and purchases - and foreign companies. These companies designed models with the technical specifications tailored to the client of Telefónica and Citesa managed to approve the first wireless phone that was certified in Spain (Annex 1)⁵⁷.

Alcatel Citesa included in the feasibility plan a program of wireless phones with development and manufacturing in Malaga. As a consequence of this program, three families of wireless telephones were produced and marketed -T4000, Evolution and Eole, characterized by original designs and superior quality and performance to those coming from Asian countries. However, some commercial successes such as supply to large operators - Telefonica and France Telecom - and a general recognition of quality in the market did not translate into positive profitability. The fundamental reason lay not in the liberalisation of the market but in the conversion of CTO phones into consumer products in which the decisive factor - price and to a lesser extent immediate attractive aesthetics - and factors such as quality, technology, functions of a certain sophistication etc. were not considered by the buyer if the product exceeds the price entry barrier.

Despite its leadership in this product range, at the beginning of the 1990s, the parent company began to centralize the business decision in Paris with the consequent absorption of the marketing responsibility of the subsidiaries, including CITESA. As from 1997, Alcatel Citesa was forced to cease manufacturing CTO phones in Malaga, entrusting their manufacture to a Chinese company. Consequently, public subsidies ceased to be granted for development activities related to this product line, which were financed entirely by Alcatel Citesa's own funds⁵⁸.

Therefore, in this type of market, European industry was unable to compete with Asian companies, which were based in countries with

very low labour costs (mainland China, Malaysia and Indonesia) and which benefited from economies of scale brought about by access to the US market. Moreover, a significant part of the components and parts of these phones lacked high quality standards and could be purchased at a very competitive price in the Asian market.

As we know, the feasibility plan also contemplated the manufacture of other types of equipment - conventional and coin-operated public telephones. As we know, the feasibility plan also contemplated the manufacture of other types of equipment - conventional and coin-operated public telephones⁵⁹. Even with forecasts of constant sales of 400,000 phones per year, the opening of the markets left room in the Spanish market for a strong demand for a reliable and quality basic phone. On the other hand, the opportunity arose to include in the basic telephone the elements necessary for easy access to the additional telephone services that the operators, including Telefónica, began to offer. Under the direction of Telefónica and in collaboration with two of its traditional suppliers, Alcatel Citesa developed and manufactured the Forma phone in three versions - Forma 1, Forma multiservicio and Forma multiservicio v2 -, along with versions aimed at some of Telefónica's South American markets. This strategy made it possible to achieve stable production of more than 1,2 million units during the last three years of the plan, practically doubling the sales figure in 1998 compared with 1993. As from 1999, Telefónica changed its Forma model for the Domo, which included greater features, and entrusted part of its production to Alcatel Citesa. At the same time, the parent company decided to transfer to Alcatel Citesa the manufacture of the digital terminal model UA (dedicated switchboard terminals), which incorporated new features⁶⁰.

Very different luck ran the coin-operated pay phones. The initial forecasts - constant production of some 25,000 units over the five years of the plan - clashed with a significant

demand for this equipment because of its potential use as a support for value-added services. Telefónica adopted a specific strategy to develop this type of market by counting on Alcatel Citesa as its exclusive technological and industrial partner. This strategy was based on a cooperative management system for the prepaid telephone service with function sharing. Telefónica provided the telephone network, its subsidiary Cabiltel operated and maintained the service and the customer - normally a public establishment - provided the site and carried out the collection. As a result, sales doubled between 1993 and 1998 and the operating model of the service shifted to other markets that introduced that product range. This was the case in several countries - Hungary, Portugal and Chile - and many telephone service operators in South American countries - Brazil, Argentina and Peru - made specific requests. As evidence of this expansive market trend, in 1999 Alcatel Citesa had budgeted a sale of payphone units three times higher than that foreseen in the original plan. We closed our reference to the

viability plan with the commitment acquired to manufacture fixed radio access equipment based on mobile coverage, on a temporary basis and under subcontracting for another Spanish division of the Alcatel group⁶¹.

The global marketplace: exports and partnerships

Mention of exports requires, at the very least, reference to the mechanisms or channels of these exports. To achieve this, we used the information provided by a testimony on the exports of telephone sets to Japan, in whose market Citesa was the first foreign company to enter. Firstly, and in order to intervene in the debate on internationalisation, we are talking about exports without an office or commercial delegation in the country of destination of the products. The processing of the information has allowed us to break down the process of penetration into the Japanese market of a specific CITESA product, telephone sets (Table 2).

Table 2. The cycle of equipment exports: CITESA in Japan

Phases	Place of action	Entity/Section involved	Content
1 (1981)	Berlin	Marketing of Citesa	Japanese market situation
2	Málaga	Citesa's Management	Reception information
3	Málaga	Citesa's Management	Decision to attempt entry into Japan
4	Málaga	Sales of Citesa	Sending the sales engineer to Japan for more information
5	Tokyo	IT&T Office	Involvement in the issue
6	Málaga	Sales of Citesa	Achievement of Japanese specifications
7	Málaga	Citesa Sales	contact with a possible distributor (SUN)
8	Málaga	Sales of Citesa	Sales Report to Citesa
9	Málaga	R & D of Citesa	study of specifications, testing and models
10	Málaga	R & D of Citesa	test required; passing
11	Harlow	Standard Telecommunication Laboratories	tests; positive
12	Málaga	Marketing of Citesa	pre-agreement with the distributor (quantities, prices, guarantees)
13	Tokyo	Marketing of Citesa/SUN	setting up aspects with the distributor
14	Málaga	(Citesa Sales)	Sample preparation and information for approval and shipment to Japan
15	Japan	IT&T office	Cooperation with the distributor in administrative procedures; fast obtaining of the homologation
16	Málaga	Sales of Citesa	First shipments during one year and entry of other competitors; price reduction
17	Japan	distributor	Request to CITESA of some changes in the characteristics of the model
18	Japan	Sales/distributor	Fixing the changes with SUN technicians
19	Málaga	R&D	Making changes
20	Málaga	Sales	Start of deliveries

21	Japan	distributor	information on product mismatches and possible corrections made by their technicians in Japan
22	Málaga	Factory	Application of changes to production
23	Málaga	(Sales/Marketing)	Request for samples of the readjusted product and check
24	Malaga	(Sales/Marketing)	Subcontracts with the distributor to readjust devices in Japan, charging the costs to CITESA (less than \$1 per unit)
25	Málaga	Sales	Explanation on invoicing costs of device adjustments
26	Málaga	Industrial Engineering of Citesa	Study of adjustment costs
27 (May 1984)	Tokyo, Japan	SUN/Sales/Marketing	Discussion with SUN: comparison of calculations, clarification of misunderstandings and admission of error by SUN

Source: Based on Lorenzo Martínez, Testimony, September 18, 2008.

Citesa's first export of prepaid appliances was to the United States in 1986. A testimony allows to trace the channels put to contribution to access the market in Hungary. Citesa invoiced Alcatel Hungary, which in turn sold to the operator Matáv and provided local support. The process was as follows: Alcatel Hungary learns about the bidding process of the Hungarian operator Matáv Hungarian Telecommunications Company Ltd.⁶² (Systems Department, Systems Engineering and SW development) and the commercial section; adaptation to Matav's requirements (from the product to the Hungarian network and from the Azkoyen validator to the country's coins, increasing the range and power of discrimination; recourse to the Spanish embassy in Athens to obtain a set of fraudulent coins; transfer of knowledge to Matav personnel (training course and acceptance tests of the validator with an engineer and an inspector from Matáv)⁶³.

Export to Australia began in 1982, just one year after the first information on Australian demand for gondola-type telephone sets was received. The poor quality but low priced copies of the Gondola manufactured in Taiwan and Hong Kong sank the Citesa Australia market⁶⁴.

In practice, exporting meant more than just selling products. When Citesa signed a contract to sell System 12 electronic exchanges to Teléfonos de México, it undertook to create a training, maintenance and repair centre. We emphasized, an educational establishment with after-sales service and not a sales office. The general behaviour of the sector in subsequent

years and a specific testimony for the case authorize to think that it was a habitual practice as an element of marked competitiveness⁶⁵.

We therefore consider export to be only one aspect of a company's presence on the world market. Let us now see if there were other modalities of penetration. By abandoning IT&T's own organisation, based on geographical areas, and adopting one based on "product lines", the Malaga factory was included in the Business System Group. In line with the structuring of the financial decision pyramid in Paris, Alcatel NV implemented its own reporting system⁶⁶.

The strategy of the multinational led Citesa to become involved in the internationalization of its activity. After sealing an alliance in 1999 with the electronics manufacturer Thomson Multimedia, at the beginning of the following year Alcatel set up a 50/50 joint venture with this company under the name of Atlinks, to which it contributed its telephony assets, including its factory in Malaga. Atlinks was created to compete in the digital communication market on the Internet, the last step in the merger of the fixed telephony, Internet terminals, ADSL modems and digital cable businesses of the partners⁶⁷. By then, annual sales of 84 million euros had already been achieved, of which 65.6% was for export. After one year, Atlinks repeated the formula with a complementary company and one of the leaders in the sector, the French multinational A Novo, well chosen for the success of the conversion of the recently acquired TRT-Philips factory in Brive, with the mission of diversifying

and optimizing the production capacity of the Malaga plant⁶⁸.

In fact, A Novo committed to extend the production of fixed telephones in Malaga and, at the same time, to diversify it, incorporating the maintenance and repair of GSM telephones and decoders⁶⁹. This meant maintaining the levels of activity at that plant, namely 287,000 exchanges per year, a high volume of fixed telephones, in particular 980,000 of the Domo model, and 60,000 public telephones, destined for the domestic and South American markets in the first case and for the South American market in the second. According to the agreements, after two years the whole of the capital would go to A Novo, which would own the Malaga factory and take over the workforce, except for 50 employees, who would be integrated into the structure of Atlinks España and dedicated to commercial and development activities. Both partners reaffirmed the objective of a presence in the domestic and South American markets. In an additional clause in the contract, the parties undertook not to compete with each other for seven years⁷⁰. Atlinks therefore sold the production plant to A Novo, which is present in the country as the majority shareholder in the newly formed A Novo Comlink España S.A., which would partially integrate the existing workforce⁷¹. Atlinks, managed by Thomson Multimedia and already a world leader in residential telephony and the Internet, retained the initial and final phases of the production process, i.e. the design and marketing of the products. The Malaga plant began processing Philips phones (GSM and residential) around mid-2001⁷².

The activity increased in 2002 with the manufacture of mobile phones as a subcontractor for neighbouring Vitelcom. A Novo's workforce grew with the hiring of temporary workers, mostly on loan from temporary employment agencies, including Adecco and ADPG. However, Vitelcom's activities were not maintained, and A Novo Comlink España was left with a workforce of 291

workers on permanent contracts, 92 on temporary contracts from A Novo and around 100 on secondment from ADPG⁷³.

During the period when Alcatel held a stake in the capital of A Novo through Atlinks, the Malaga factory was guaranteed a volume of work by a two-year contract and A Novo closed with a profit. At the end of the transitional period, Alcatel ceased production in Malaga of U.A. and DECT phones, which it relocated to other of its plants in France. Unarmed because it had not responded quickly enough to the market, the Malaga factory was forced to undergo further restructuring and, with it, a thinning out of the workforce through a three-phase redundancy programme. To finance this, it sold the PTA factory to A Novo and moved to smaller facilities on a rental basis. Atlinks was spun off into two different companies and eventually became Thomson España, which designed, produced and marketed the models of the classic telephone. Its market was the domestic and export market - Sweden, Australia, the United States and Japan, as well as many European and Latin American countries. It had commercial offices in Madrid and Chile⁷⁴.

To top it all off, in mid 2007, A Novo's telephone plant in Malaga manufactured the latest batch of Domo phones for Thomson Spain and specialized in the maintenance and repair of fixed and mobile telephone terminals and other electronic devices⁷⁵.

Conclusion

This study has looked at the understanding of the global shaping process of the telecommunication industry in the two final decades of the twentieth century and the first years of the new millennium.

The establishment in Spain of important multinationals in advanced technologies has made this country a battleground for the global recomposition of this sector, which followed the break-up of the North American multinational AT&T and the liberalisation of the market.

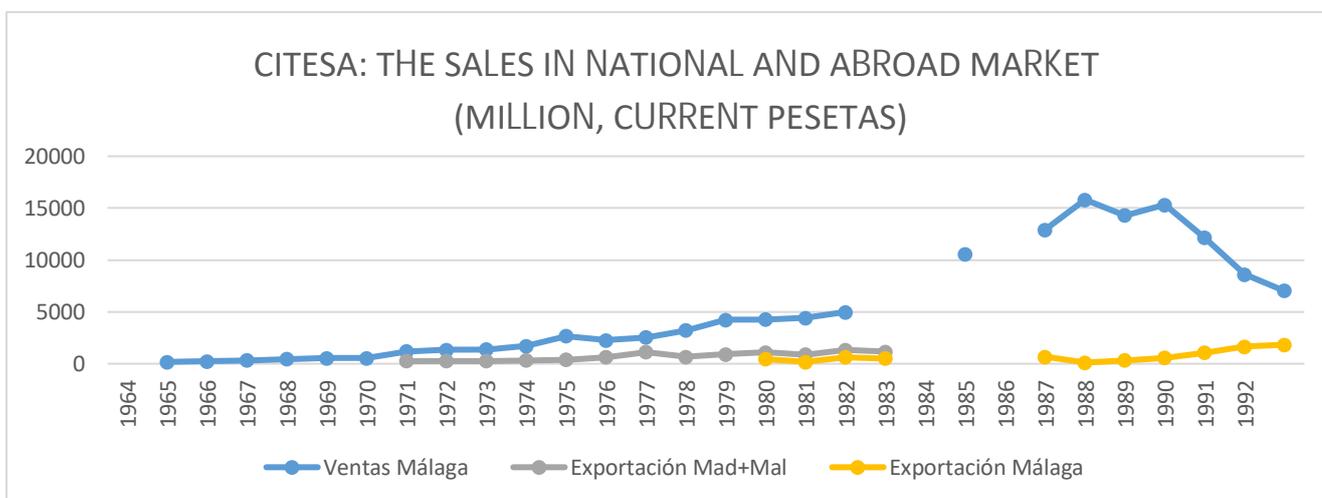
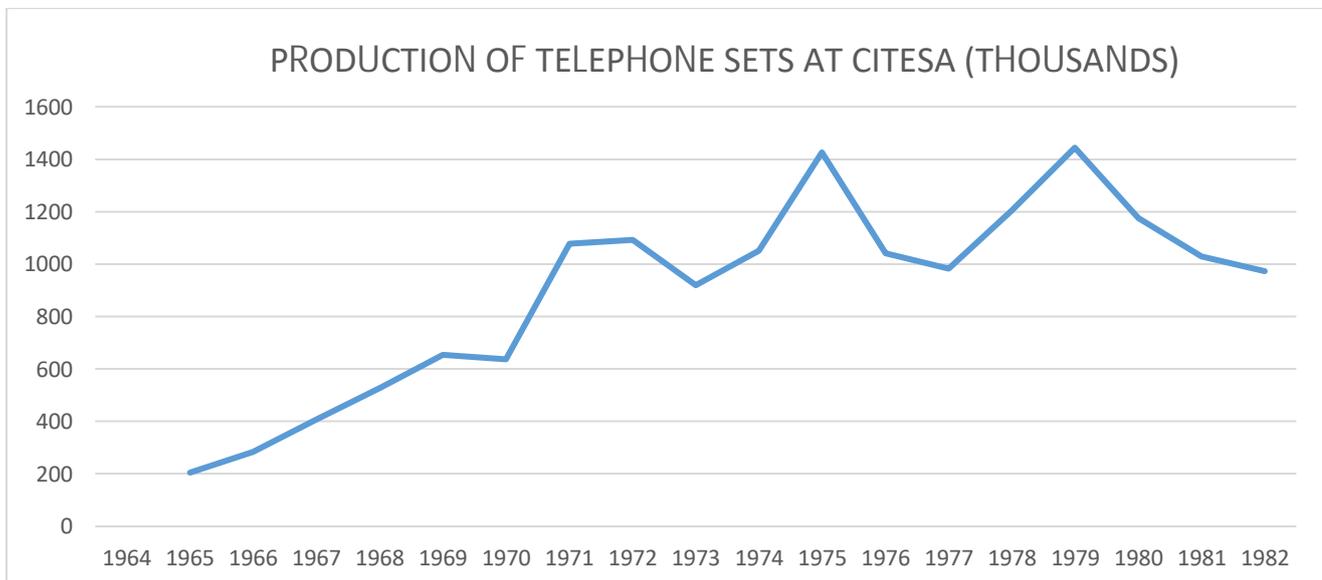
The period encompasses the transition from an industry based on the close linkage, if not strict integration, between the monopoly of the telephone service and the national telecommunication equipment industry.

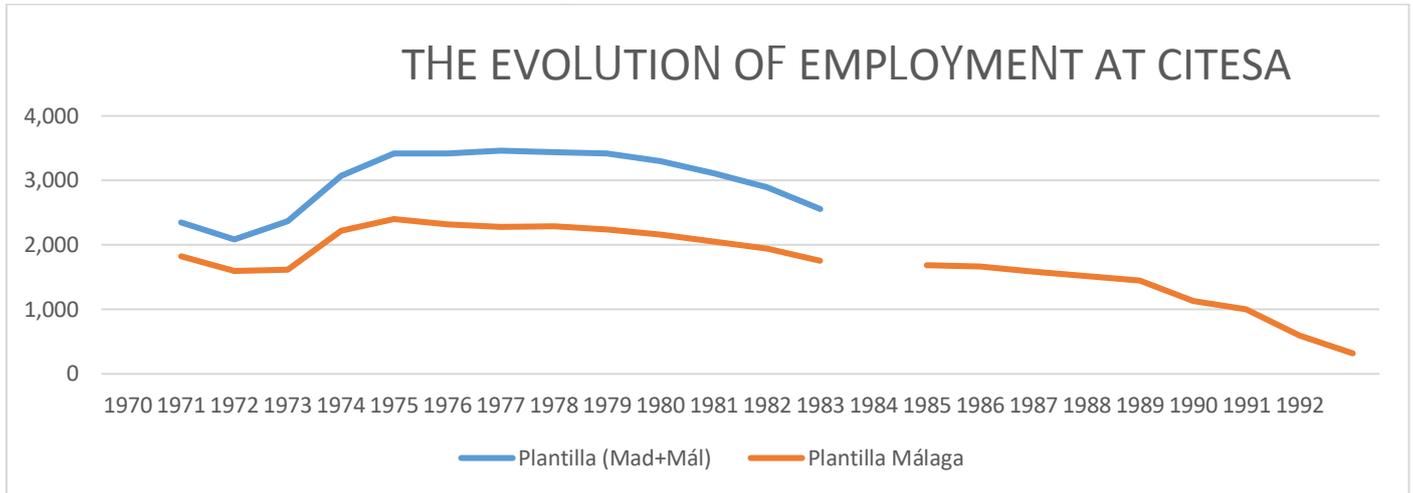
The four main sections in which the study is structured have successively dealt with the origins and evolution of Citesa, the crisis and restructuring, the positioning in the face of market globalisation and the strategies adopted in the face of the world market.

In this study, the territorial component and the location factors take on great importance.

The case study illustrates a change in strategy of some multinationals, which moved to centralize the major market options, within which Citesa was assigned specific functions in the world of Alcatel, far from the relative autonomy characteristic of the IT&T era. Technological and corporate dependence in a transition from captive market to competition forced alliances, mergers and internationalization, largely in Latin America, in search of economies of scale. Finally, the changing conditions of the various fractions of the world market led to outsourcing in the telecommunications industry.

Appendix





Annex 1

Citesa did not have the skills needed for wireless. As a result, it conducted a survey of available wireless devices in the "four dragons" of East Asia. After study visits in Japan, Hong Kong, Taiwan and Korea, a device from the Taiwanese company Sampo Corp. was selected, with which an ODM (Original Design Manufacturing) type supply agreement was reached. This agreement, in accordance with the strategy of penetration in Europe, meant the outsourcing of the design and manufacture of an equipment following the specifications and quality levels of the buyer. The agreements contemplated the transfer of manufacturing technology from Sampo to Citesa to carry out a certain level of local assembly in Malaga. As an outcome, the Telyco Delta telephone, the first approved fixed wireless telephone in Spain, which was sold to Telyco, a trading company of Telefónica. In its second facet, the plan led to the creation of a team to develop the products internally. Newly hired engineers who are experts in radio frequency technology joined the company's existing electronic and SW design technicians. This group came to lead Alcatel in the development of the CT0 analog technology wireless phones. The same did not happen with the DECT phones, which ended up being centralized in France. From an economic point of view, the success of the wireless phone business did not come until manufacturing was done entirely in China. It was unfeasible to carry

out local assembly without having the costs and the market to compete with the global Chinese factories⁷⁶.

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24. Alcatel Citesa SA (1999), p. 2; Bennetts (1994), p. 164. Citesa was credited with being present with its products in 1976, the year of the contract with Nigeria to be carried out in five years and for a value of more than 26 million dollars, in more than half a hundred countries: *Economista: Revista Semanal Científica e Independiente*, 88, 1976, p. 53.
 25. The workers' negotiators were aware of the power of the multinational IT&T and the possibility that it would use the threat of ceasing its activity in Spain: Fact sheet of the trade union section of Comisiones obreras of Standard Eléctrica, Madrid, 31 August 1982, pp. 4 and 20. The mechanical workshops of Citesa, as well as those of Toledo, were to be dismantled and only those of Villaverde would survive.
 26. The employment redundancy programmes affected 2,700, 1,400 and 400 workers, respectively: González (1982), pp. 8-10. In July 1982, the government granted the IT&T group in Spain ESP 4,600 million in official credit, subject to investment commitments, among others. The announcement of a workforce regulation file, which would affect 700 workers, led to mobilisations: *El País*, 2 March 1982.
 27. In the face of press reports, the company refused to provide guarantees and extensions: Intervention of the President of Citesa, Audio of the session of the Transport, Tourism and Communications Commission, Congress of Deputies, 2 February 1982.
 28. Most important customers in 1982: Telefónica with approximately 60 % and other national customers with 21,5 %; 18,5 % went to export: Speech by the President of Citesa, Audio of the session of the Committee on Transport, Tourism and Communications, Congress of Deputies, 2 February 1982.
 29. Manuel Márquez Balín†, Madrid, 18 July 1983; the remaining workforce was integrated into Villaverde: López (2008), p. 9; LAV, 25 November 1982; ABC, 29 September 1982; *Network World*, 14 December 1987, p. 5. The share capital of Standard Eléctrica was set at more than 12,335 million pesetas: *El País*, 25 November and 29 September 1982. It was known that SESA tended to turn to other sister companies in the IT&T group to supply Telefónica with new imported products, such as AUTRAX measuring equipment for the management of complete telephone systems: *El País*, 1 November 1983.
 30. Supreme Court, Madrid, Section 2, 15/12/2008. Of the importance of copper in the previous phase, speak, for example, the warnings to Citesa by IT&T - later involved in the conspiracy against the socialist president - about the possible alteration of prices with the triumph of Allende in Chile: United States. Congress. Senate (1973), p. 301.
 31. López (2008), p. 10; González (1982), pp. 8-10.
 32. Statement by the President of Citesa, Audio of the session of the Committee on Transport and Communications Committee on Transport, Tourism and Communications, Congress of Deputies, 2 February 1982; Alcatel Citesa S.A. (1999), p. 2. For digitalization in general, see Stone (2015), pp. 157-165.
 33. Royal Decree-Law 9/1981, of June 5, on measures for industrial reconversion, BOE, 138, June 10, 1981, pp. 13,115-13,117; it was reported in the press: *El País*, May 13, 1981 and replaced by Law 21/1982, of June 9, 1982, on measures for industrial reconversion (in force until December 31, 1982): BOE, 169, July 16, 1982, p. 19,293. In the opinion of one of its main architects, the reconversion was based on a "pragmatic system of privatizations" whose functioning initially fitted into the processes marked by the Ministry of Industry. The privatisation system defined that companies that were not viable should be closed down, but others that had the opportunity to become viable needed to form part of a group: SEPI, Press Room, 26 November 2018.
 34. Written reply from the Ministry of Public Works and Transport to the Socialist Group's written question 684/010260 on the existence of a medium- and long-term viability plan for Fujitsu España, S. A.'s manufacturing plant in Malaga.
 35. Royal Decree 1,380/1984, of 20 June, declaring the conversion of the IT&T España group of companies (Standard Eléctrica, S. A., and Marconi Española, Sociedad Anónima); for further details, see Author (forthcoming). Some scholars (Benton, 1990, p. 171) directly include Citesa as a company in conversion according to the aforementioned Royal Decree.
 36. One of the major unions -CCOO- opposed the agreement proposed by the Administration, considering it unfeasible if there were no certain guarantees of the demand of CTNE and because it meant putting the economic strengthening of the IT&T group on the backs of the Administration and the workers, due to very strong increases in

productivity and layoffs. One of the demands was to bring Citesa's wages and working conditions into line with those of SESA: Federación del Metal de CCOO, Secciones de CCOO del grupo IT&T, Madrid, 12 January 1984. Citesa, like Marconi, had lost some ESP 800 million in 1980. The need to restructure the activities and size of both, especially of one of Citesa's sections, which was in direct competition with Standard, emerged. Within a situation of blockade of the collective negotiation and worker's mobilization, Citesa proposed a salary increase of 7% and reduction of the working day; in Marconi, the offer was of a 3% salary increase, conditioned to the acceptance of the employment regulation, denied by the labor authority the previous day: *El País*, January 24, 1981.

37. Admission to procedure of the request for the appearance of the Councillor for Development and Work before the Committee on Economy, Industry and Energy, in order to present a report, be known and be debated in the meeting about the situation of the workers of CITESA, located in Malaga, and presented by the Honourable Mr. Andrés Cuevas González and five other Deputies, of the g.p. Izquierda Unida-Call for Andalusia: *Boletín Oficial del Parlamento de Andalucía* (Official Gazette of the Parliament of Andalusia), 213, June 14, 1988, p. 6,553.
38. Even with an emphasis on specialization in the field of audiotelephony, the planned production included telephone sets, multiple systems, voice and data systems, prepaid devices, wireline devices, telepoint system devices, cellular radio telephones and low-capacity peripheral equipment and switchboards: Non-Law proposal regarding the employment and economic situation of Alcatel-Citesa, presented by the Izquierda Unida Group - Call for proposals by Andalusia, *Boletín Oficial del Parlamento de Andalucía*, 102, 27 September 1991, p. 3.878.
39. It is noteworthy the evasive answer from the Government, by the Minister of Industry Aranzadi, to the inquiry about the measures to guarantee the compliance with the agreements between the CTNE and CITESA: "CITESA is a manufacturer of telecommunications equipment and, therefore, a supplier of Telefónica de España, S. A. This company is a private company, with State participation, whose purchasing management is carried out by its administrative bodies to achieve a better profitability": *Diario de Sesiones del Senado*, 66, May 7, 1991, pp. 3,604-3,605.
40. 7 May 1991, pp. 3.604-3.605; the number of employees was 74 less than the figure committed

and 331 workers were on unemployment proceedings: *Boletín Oficial del Parlamento de Andalucía*, 102, 27 September 1991, p. 3.878. The right-wing opposition in the Andalusian Parliament recognised the effort made - investment of more than 9. The right-wing opposition in the Andalusian parliament recognised the effort made - investment of over 9 billion pesetas in the four-year unemployment plan in Malaga - and the achievements - conversion into a world leader in some products - while at the same time demanding that the regional government bear the cost of R&D: Speech by the spokesman for the popular parliamentary group in Andalusia (Gutiérrez de Ravé), *Diario de sesiones del Parlamento de Andalucía*, 81, III Legislatura, 13 October 1992, p. 4.071.

41. In 1991, the political opposition denounced the lack of control over the redundancies and the employment regulations, supported by public money, as well as Alcatel's incentives to subcontracting and, with them, the underground economy: *Diario de Sesiones del Senado*, 66, May 7, 1991, 4,071, pp. 3,604-3,605.
42. Question by the representative of the Mixed Group, 29 April 1991, *Archivo de las Cortes Generales, Senado*; Intervention by the representative of the Izquierda Unida-Convocatoria por Andalucía Group, (United Left Group - Call for Andalusia), *Diario de sesiones del Parlamento de Andalucía*, 81, III Legislatura, 13 October 1992, pp. 4,066-4,074. In addition to the crisis that Alcatel-Citesa had been going through for some time in the province of Malaga, there was also the weakness and fragility of the industrial sector, visible in the disappearance in fifteen years of fifty companies in the metal sector with a significant destruction of employment and wealth: Intervention by the representative of the Izquierda Unida-Convocatoria por Andalucía Group, *Diario de sesiones del Parlamento de Andalucía*, 81, III Legislatura, 13 October 1992, pp. 4.066-4.074. Here there is an important debate. The spokesman for the Andalusian parliamentary group exempted Citesa from responsibility for the serious situation and blamed the lawsuit. According to him, Telefónica awarded Interisa, which is owned by a former Telefónica CEO, a contract for more than half a million telephones per year for several years, worth some 18 billion pesetas. Interisa, a non-manufacturing company, should simply act as an intermediary and subcontract with companies based in Spain, or, in the worst case, buy the requested products in the

Far East, without generating jobs or added value for the Spanish economy: Intervention of the spokesman of the Andalusian parliamentary group, *Diario de sesiones del Parlamento de Andalucía*, 81, III Legislatura, 13 October 1992, p. 4.070.

43. SESA senior executive Marquez Balin (2016, p. 94) pointed out that it would not be fair to point to Alcatel as the great culprit.
44. Alcatel Citesa SA (1999).
45. The left-wing opposition criticised the Autonomous Government for the lack of a design, within the framework of general policy, of adequate policies for intervention and dialogue with the multinationals: Hearing of the Minister of Labour to report on the plans to reduce the workforce by the company of ALCATEL-CITESA and on the implementation of the agreement adopted by the Parliament of Andalusia in plenary session on 13 October 1992, concerning the viability and maintenance of employment in ALCATEL-CITESA, *Diario de sesiones de comisiones (Journal of Committee Sessions)*, Documentary Fund No 74, III Legislature, 19 May 1993, p. 4. The aid was intended for the start of civil works, the manufacture of the new digital wireless telephone in a quantity of 300,000 units per year and the maintenance of the level of employment for ten years: Alcatel Citesa SA (1999), p. 3; Alcatel - Citesa, *Diario 1 (Canal Sur TV)*, Ephemeris of 9 June, consulted at <http://blogs.canalsur.es/documentacionyarchivo/malaga-la-fabrica-de-telefonos-de-alcatel-citesa-en-martiricos/>
46. Alcatel Citesa (1999b), p. 2
47. Alcatel Citesa SA (1999), p. 4; CDTI, "News", June 1994, p. 5. Between 1994 and 1996, the Ministry of Industry and Energy granted Citesa a total of 296,678,074 pts. as subsidies for investments in specific R&D projects on GSM, POS, DEC and CTO technologies: Parallel Multiprocessor System for Control of Telephone Terminals; Multiline System according to the European Digital Cordless Telecommunication (DECT) Standard: CDTI, "News", June 1994, p. 5.
48. Alcatel Citesa (1999b), p. 6.
49. Alcatel Citesa SA (1999), p. 16.
50. Alcatel Citesa SA (1999), p. 4.
51. We underline the official reference to the investment in machinery of Citesa in the Malaga factory - about 3,500 million pesetas: Ministerio de Industria y Energía (1994), p. 144. They included: 3D mechanical design systems (Proengineer) and computer aided printed circuit board topological

design (Menthor graphics); electronics, radio frequency, telephony and electro-acoustics laboratories; Faraday and low noise cameras; Getel cell for electromagnetic radiation measurements; personal computer in all work stations; local area network and Internet network. After the industrial investments of the plan, the basic equipment of the Alcatel Citesa factory was at the end of 1998 the following: automatic warehouse for components management; printed circuit board assemblies: four miniature component lines with a capacity of 360 million components per year and an inert atmosphere wave soldering machine; inert atmosphere refusion oven; automatic machines for inserting conventional components with an annual capacity of 105 million components; structural test equipment integrated into the assembly lines; assembly lines for final assembly of devices: automatic for telephones with a capacity of 1,5 million devices per year, for public telephones (150.000), automatic for DECT terminals (250,000) and for DECT base stations (275,000); automatic test equipment and new SAP manufacturing management computer system put into operation in January 1999: Alcatel Citesa (1999), pp. 6-7. The new factory for the subsidiary CITESA had an annual production capacity of 1.3 million terminals and made sales of PTA 173 billion in 1994, the bulk of which was exports: *Computerworld*, 10 November 1995.

52. Junta de Andalucía, Council of Economy and Finance, Málaga, 1998.
53. Alcatel Citesa, Intervention, 1999.
54. Comité de empresa de Alcatel-Citesa (1992), p. 2.
55. The PCR or access terminal was an electronic device with a concentration or distribution mission, similar to the current PTR: Calvo (2016), pp. 220-221.
56. López (2008), p. 12.
57. Testimony, José Luis Casado, 8/2008; Casado (2012); Approval certificate to the Alcatel cordless phone, model Delta II, manufactured by Sampo Corporation in Taiwan: BOE, 299, December 14, 1990, p. 37.306.
58. Alcatel Citesa (1999), p. 10.
59. Alcatel Citesa (1999), pp. 7-10.
60. New features of the digital UA model: identification, hands-free, amplifiable reception, messaging, date and time display, call status information: Alcatel Citesa (1999), pp. 7-10.
61. Alcatel Citesa (1999), pp. 7-10.

62. Alcatel Citesa's software engineering R&D department in Málaga developed the code governing the functions of a telephone and designed the models for the domestic market, i.e. Telefónica, and for export, predominantly to Latin America: BIT, 174, April-May, p. 11.
63. Rafael Vertedor, Testimony, December 9, 2007.
64. The course was as follows: meeting held at STL (Harlow), transmission of information by Standard Telephones & Cables of Sydney, contacts of Citesa with STC Sydney and with IT&T in Spain and IT&T in New York; assignment of manufacturing to Málaga and trip to Sydney to negotiate with Australian Telecom; meetings with Australian Telecom in Sydney and in Melbourne; achievement of the order and start of deliveries in 1982; quality problems; trip to Sydney in 1983; study of the problem in Sydney, Harlow (STL), Málaga and CMOS manufacturer's laboratories (IT&T Intermetall, Fribourg); discovery of the cause in Málaga; stay in Málaga of a Chilean inspector from STC Sydney: Lorenzo Martinez, Testimony, September 15, 2008; another protagonist speaks about the after-sales assistance when referring to "work trips I made for Citesa": Rafael Vertedor, Testimony, December 30, 2007.
65. Manuel Márquez Balín, Personal communication, 5 June 2017; BIT, June-July 1980, p. 31. In the Asian telecommunication industry, technical support and hardware maintenance were usually provided by the large telecommunication equipment suppliers, including Alcatel-Lucent: Emerging Strategy (2008), p. 3.
66. In accounting and financial matters, Málaga continued to operate as a division of SESA, whose accounting was consolidated in Madrid and the reporting to the parent company Alcatel moved from Brussels to Paris. As for treasury, which was totally centralized in SESA, the need for financial resources such as the liquidity positions generated in Málaga were managed daily by the central treasury through automatic transfers in one direction or another until the morning balance of the bank was zero: Testimony of Ángel López Esteve, April 2008.
67. El País, 26 February 2000. The Competition commission takes note of the takeover by Thomson Multimedia, S. A. of the whole of Alcatel Citesa, S.A. through OTALEC: CNMC, 11 November 1999.
68. The performance at the TRT-Philips factory in Brive showed A Novo the way to transform a production plant into another one for industrialized services, infrastructure maintenance and technology for new products. In addition to Málaga, A Novo acquired a factory in Milan. In 1998, it embarked on a process of international expansion with various acquisitions, including a 74% stake in the Spanish company Sadelta, which specialises in the mobile phone business and has two subsidiaries, Tecnosoporte, located in Barcelona, and Coretel, based in Valencia, of which it owned 100% and 50%, respectively. This acquisition allowed A Novo to build a partnership with Airtel, the future Spanish subsidiary of Vodafone: A Novo (2000-2001), p. 5. Sadelta began its activity in premises in Barcelona and then moved to the Vallés Technology Park, a pioneer of technology parks in Spain: Bennetts (1994), pp. 7-9; LAV, 25 November 1982. In 1997, Thomson focused on the manufacture and assembly of key components and consumer products, accounting for 98% of sales. The significant deterioration in the operating results and financial situation in the 1990s forced a recapitalization by the French State, through TSA, the former Thomson SA. Several restructuring and re-engineering initiatives allowed profitability to be restored. In mid-2000, Thomson deployed a repositioning strategy by incorporating new segments of the video industry into the traditional consumer electronics market+: US Securities and Exchange Commission, file number 0-3003, 2003, p. 23.
69. Chairman of the Works Council of A Novo Comlinks Spain to M. Chaves, President of the Junta de Andalucía, 8 April 2005.
70. Asociación Atlinks-A Novo, Colombes, 1 December 2001; L'Atelier, 13 November 2000 A Novo was established in fourteen countries and was active in video and telecommunications, e-money and information technology. As agreed, Alcatel had an option to sell its 50% stake in Atlinks as of October 2002. By a February agreement between the partners, Thomson was to pay EUR 68 million in cash in exchange for Alcatel's stake in Atlinks: Thomson Group, Annual Report 2005, p. 132.
71. Rafael Márquez Gallo, Málaga, 24 January 2001, For the attention of the Works Council of Atlinks España. In January 2001, the A Novo group set up A Novo Comlink in which it acquired a 33% stake, doubling it the following year and bringing it under full control: A Novo (2000-2001), p. 26. A Novo Comlink España, arose from the transfer of assets from Atlinks España and the combination of all its Spanish service activities: A Novo (2000-2001), p. 38.

72. Only half a year after starting the repair activity, A Novo Comlinks was already carrying out repairs on 150,000 units a year and was aiming to win a contract from Telefónica Móviles: A Novo (2000-2001), p. 26.
73. Chairman of the Works Council of A Novo Comlinks Spain to M. Chaves, President of the Junta de Andalucía, 8 April 2005.
74. La Última Milla, 2, January 2006, p. 5. In 1988, Thomson Telecom España SA was set up to import, manufacture, sell, export, install and maintain telecommunications, electronic and computer equipment, systems and accessories: Málaga Register of Companies, sheet MA-3.647, volume 1,633, folio 69, 18/11/1988.
75. The redundancy programme contemplated the dismissal in September 2005 of all those over 55 years of age, who would go into partial retirement at the age of 60, until the age of 65 when the definitive retirement took place: Testimony of Ángel López Esteve, April 2008. The market for DECT standard phones in Europe grew from more than six million units in 1998 to 11 million two years later. Atlinks manufactured phones, Internet terminals and modems for Alcatel, Thomson, General Electric and RCA; it made half of its sales in the USA and 30% in Europe: Les Échos, 30 June 2000. Miscellaneous electronics included desktops and laptops, game consoles and TV set-top boxes: Sur, 17 January 2010.
76. Casado (2012).

