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THE EMERGENCE OF GLOBAL COMPANIES IN THE HIGH-TECH INDUSTRY OF DEFENSE: THE CASE OF INDRA IN SPAIN, 1993-2007*

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Abstract

This article analyzes the intricacies of the creation and early evolution of a Spanish high-tech company in the defense sector –Indra- and the involvement of diverse actors in the context of an increasing globalization. The study tests if the State worked as a shield behind which Indra withdrew as a shareholder and buyer or if market criteria were met. The text is structured in four main sections, which respond to the primordial stages of Indra. The first refers to the birth, the second to the restructuring, reorganization and consolidation of the company in the period 1993-1998 and the third to the subsequent growth, while the last deals with the internationalization, one of the distinguishing aspects of the period of Indra. The research is based on sources of diverse nature and provenance, mainly those of the company, as well as in newspaper archive material and in an extensive specialized bibliography. The study concludes that the keys to Indra's success lie in its commitment to investment, its restructuring and its external expansion, heavily backed by the State.

Keywords: ICT, High-Tech Firms, Mixed Companies, Internationalization

1. Introduction

For the mainstream of specialists, Information and Communication Technologies (ICTs) are a pillar of today's economy and society (OECD, 2003). The international debate focuses on the ways to promote the productive and inclusive use of ICT, considered a general purpose technology (David, 1991). Is it enough to expand infrastructures or is it necessary to create legal, institutional and policy frameworks geared towards the development of nations? (United Nations Conference on Trade and Development, 2005). Bearing in mind that one of the main protagonists of the development processes of the different countries is the companies, the study of them can contribute to improve the knowledge about the mechanisms and ways of progress. ICTs cover a wide range of products and services, including those in the defense industry, which, on the other hand, appear difficult to isolate as a separate entity and far from being a homogeneous industrial sector (Anthony, 1994). The idiosyncrasy of that activity, considered strategic by the large international institutions, to which is added the context of the globalized economy in which it operates, has sparked heated academic debates, as it is shown in a statement of European Commission (2009).

The cold war gave way to a profound change in economic power and, within the modification of the global strategic landscape, in the distribution of defense spending (Ablett and Erdmann, 2013). Specifically, the world defense industry changed with remarkable rapidity. In the US, the process of rationalization left a small dominating group of firms and European defense

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companies followed suit a slower pace. From these domestic changes, the European industrial defense sector began to assume a more international dimension, resulting in a globalization process. 'National' defense industries, especially in Europe, have already been diluted by international collaboration to develop specific projects (Hayward, 2009). Further exploring this perspective, disarmament policies contributed to the contraction of markets, in a context of increased costs derived from bidding and international competition (Granrut, 1990).

The research whose partial results we present intends to contribute to the task of enriching the debates and clarifying the evolution of the defense industry in the era of globalization. Its methodology relies on a descriptive approach and on the use of sources of diverse nature and provenance, mainly those of the company, as well as in newspaper archive material and in a large specialized bibliography¹.

This article is divided into four main sections, which respond to the primordial stages of Indra, the company that is the protagonist of the story. The first refers to the birth, the second to the restructuring, reorganization and consolidation of the company between 1993-1998 and the third to growth. The list closes with the internationalization of Indra, one of the distinctive aspects of the company. In this sense, it dialogues with the prevailing theories among academics, especially the school of Uppsala, defender of a gradual process but very conditioned by the empirical basis of its model based on Scandinavian industrial sector. Since its first contributions in the mid-1970s, the model has been refining its instruments of analysis by including elements such as business alliances and franchises (Johanson and Vahlne, 1977, 1990; Johanson and Weidersheim, 1975).

The study addresses the intricacies of the creation and first steps of a Spanish high-tech company in the defense sector –Indra– and the implications of diverse actors involved in the context of an increasing globalization. It concludes that the keys to Indra's success lie in its commitment to investment, its restructuring and its external expansion, heavily backed by the State.

2. The convoluted birth of Indra: the confluence of the public and private sectors

The Spanish high-tech industry underwent three major transformations in the final two decades of the 20th century and the first of the new millennium: the restructuring of the industrial division of the North American multinational IT&T, the reconversion of Telefónica's industrial division and the remodeling of the group of the powerful National Institute of Industry (in Spanish, INI), founded during Franco's dictatorship and similar to the Italian IRI, which at the end of the 1990s had seen its majority share reduced to thirty companies. The first two occurred in the private sector and the last in the public. From the last one, a new company emerged in the short term that has played a leading role in the sector, known with the exotic and suggestive name of Indra. Arriving at this point meant overcoming a series of small obstacles to fit the different pieces involved, i.e., the INI, for the public sector, plus Telefónica and CESELSA (a contraction of the Spanish Company of Electronic Systems, S.A.), for the private.

It was the Government that took the initiative. Shortly before the end of 1988, high-ranking government and telecommunications sector officials - the Ministry of Industry and Energy together with INI, Telefónica and Amper presidents - signed an agreement for the constitution of a Spanish communications and software group. The arrangement expressly identified the need to forge alliances with foreign companies that will contribute their technology, yet CESELSA was not invited (Pérez-Nievas, 2017). At the beginning of the following year, the Ministry of Industry and Energy, in collaboration with the INI, devised a plan to reorganize the electronic sector by creating a large Spanish group. In this direction, it chose CESELSA to merge with the public Empresa Nacional de Electrónica y Sistemas, S.A. (National Company of Electronics and Systems, INISEL) into a joint venture based on an equitable distribution of capital and the intention of converting the

¹ It is worth noting that, in the absence of the Minutes of the Board of Directors of Indra, the Relevant facts of the National Securities Market Commission (hereafter CNMV for Comisión Nacional del Mercado de Valores) performs the functions in certain respects. A preliminary Spanish version of this article has appeared in Calvo, 2019.

banking sector into guarantor of the balance between the institutional and industrial partners, assigning it a minority stake of the remaining 20%. Disagreeing with this approach, CESELSA presented an alternative to the Ministry by which it admitted a specialization agreement consisting of a takeover of several sections -radar, command and control, simulation and electronic warfare activities- of INISEL. This new proposal was due to the need for specialization of the two large Spanish groups operating in the sector in specific areas of activity in the new international context of proximity of the single market, collapse of the Soviet bloc and the end of the Cold War. Spain committed a 13% stake in the EFA program (Eurofighter Aircraft or European Combat Aircraft), lower percentage than in Italy with FIAR, the Federal Republic of Germany with AEG and the United Kingdom with the Ferranti Defense System Group (Freedman, 1999).

The path of specialization was also rejected due to strategic differences and negotiations between the Government and CESELSA were suspended. Against bad omens, halfway through 1991, the government was willing to accept control of the capital of INISEL by private capital and CESELSA, under these conditions, to promote the formation of a group of companies that could acquire 51 percent of the company public (Morcillo, 1990).

A substantial part of this framework was put in place throughout 1991 with a preliminary merger agreement and had both sectors as protagonists. The process started when the INI and Telefónica concentrated the assets of their respective subsidiaries ERIA and ENTEL according to the integration modality. This union gave rise to ERITEL, controlled mainly by the INI through INISEL, with the task of developing software for computer applications. Both partners maintained a tenacious pulse for the control of the new large company, due to the strategic nature of their respective subsidiaries and the high amount of capital committed.

In October 1991, the private leg was added to the operation, CESELSA, whose top management sought, as we know, a specialization in very specific segments of its activity, without shying away from devoting the bulk of the company's resources to it (Pérez-Nievas, 2017). CESELSA and INISEL subscribed an agreement in principle to carry out the integration in two phases. The first envisaged a capital increase in CESELSA through the contribution of INISEL's shares and in the second CESELSA would take over INISEL. The bases implied entrusting the valuation of both companies to international experts and establishing a legal integration procedure, which seemed to rule out the launching of a takeover bid on CESELSA shares and to exclude this company from the stock exchange listing (CNMV, 1991, 1992). Subsequently, an Addendum fixed the relative participation of the partners in the resulting company in 2/3 for INISEL and 1/3 for CESELSA. Such participation, subject to possible adjustments that the auditors made in the balance sheets of both companies and other factors related to the equity situation, in the case of CESELSA could not be below 1/4. For its part, the constitution of guarantees in favor of INI was stipulated for 6.66% of the share capital of the company resulting from the integration of CESELSA and INISEL. The agreement led to the creation of a pledge in favor of Teneo S.A. (INI) of all the shares of CESELSA owned by the minority shareholders -Banco Bilbao Vizcaya (0.9229%) and Pérez-Nievas Group (4.9124%). The Paribas Group had 0.8246% of the capital.

At the end of 1992, the Shareholders' meeting of CESELSA agreed, among other changes, on the modification of the corporate name and the bylaws. CESELSA was renamed CESELSA-INISEL S.A., at the same time that the articles of the corporate bylaws relating to administrators and the end of the fiscal year were amended (CNMV, 1993). Finally, a capital increase for non-monetary contributions amounting to 4,313,781,000 Ptas was agreed upon.

Thus, the consolidation of the public sector advanced with an agreement between INISEL and CESELSA, which paved the way for the merger in a single group, from which an improvement in the competitive position that the partners had in the moments prior to the merger was expected. According to the plans, the group would be structured into four strategic business areas - electronic defense and dual use, consulting and IT service, civil electronics, automation and control and space-, with other head companies -CESELSA, ERITEL, Ditel and INISEL Espacio, respectively, to which correspond 44%, 31% and 22% of the sales and 54.71%; 38.67%; 0.45% and 0.20% of the workforce. In the final stretch of the negotiations, the 'powers' of the CESELSA-INISEL holding company were assets of 86 billion Pesetas, sales of 70 billion Pesetas with a fifth destined for export, an investment in R&D equivalent to 10% of turnover and a staff of 5,300 people, 64.15% of them qualified and highly specialized (BIT, 1992).

The crucial step of the one described as "convoluted operation" came with the formation of the new Indra, leader in defense systems, grouping four companies in a brand (INISEL, CESELSA, ERITEL and DISEL), and a shareholding between SAINCO and INISEL (Indra, 2006). The committed capital was estimated at 10,000 million Pesetas. In 1993, Indra's main shareholders were Teneo (63.6%), Thomson-CSF (24.99%), BBV (3.76%), Pérez Nieves Group (3.63%), Sainco (2.79%) and Banque de Paris et des Pays-Bas –Parisbas- (0.55%) (Indra Sistemas, 1993), and the shares did not show changes in 1998 (DiGiovanna and Markusen, 2004).

After its creation and until 2007, the trajectory of Indra ran through three major stages, which the specialists defined as restructuring and reorganization from 1993 to 1997, followed by one of consolidation between 1998 and 2002 to finish in internationalization from the latter year.

Here we are going to make a reinterpretation of these stages trying to adjust them better to the reality of the trajectory of the company. The globalization would continue from 2008 (Pareja, 2009) but this phase is not considered in the present study.

3. Restructuring, reorganization and consolidación of Indra: 1993-1998

Indra undertook a restructuring and reorganization of its businesses, which implied internal adjustment and made it possible to adapt to the new market conditions, to culminate in the consolidation (Indra Sistemas, 1999). In comparative study, its behavior was in line with that of other companies in the ICT sector in Spain, including Alcatel-SESA, a subsidiary of the multinational Alcatel.

By mid 1993, the extraordinary general shareholders' meeting of Indra approved the merger of CESELSA-INISEL as an absorbing company and INISEL as taken over. In this way, CESELSA-INISEL became the owner of all INISEL's shares. It also authorized the contribution of the branches of activity in defense and dual-use electronics and the branch of space electronics to two subsidiaries to 100% of the Group. Third, it gave authorization to expand the capital and restructure the business group (CNMV, 1993, 1994a).

At the end of 1993, Indra Sistemas agreed on a series of points whose execution implied the completion of the restructuring of the Indra Group. To begin with, they entailed various contributions to one hundred percent of the group's subsidiaries: to CESELSA, S.A. the branch of activity of defense electronics and dual use and to ERDISA the activity branch of space electronics, which simultaneously adopted the name of INISEL ESPACIO, S.A. The contributions were made based on the equity value of each one of them (500 and 140 million pesetas, respectively). The second axis of the restructuring affected shareholdings and defined the control group. Upon receipt of the branch of defense activity, CESELSA, S.A. had to contribute to the NATIONAL COMPANIES OF OPTICS, S.A. (ENOSA) its branch of systems and equipment for armament through a capital increase in ENOSA amounting to 5,550 million Pesetas. In the expansion, the North American Group HUGHES became, through its Spanish subsidiary, a majority shareholder by contributing 50.45% in cash, against CESELSA, S.A. that contributed 49.54%. INDRA agreed to purchase the minority interests that the majority shareholders of CESEL S.A. maintained in the Group companies and the simultaneous sale of treasury stock. This meant that the Group was made up of one hundred percent subsidiaries or jointly owned companies with a qualified technology partner and, furthermore, that the minority shareholders' interests were carried out in the Group's parent company. The restructuring of the Group and shareholdings was complemented with the sale of various properties, which generated certain capital gains. In relation to business matters and financial situation, in March 1994, the subsidiary of the consulting and services area, ERITEL S.A., agreed to reduce to zero and simultaneously increase the share capital by an amount of 4,000 million Pesetas to restore the balance between the capital and the equity of the Company, which had decreased as a result of accumulated losses. Some 144,814 shares were transferred to BBV, which represented 1.11% of its capital, according to the swap agreement signed between Indra and BBV on 31.12.93. Once this transfer was made, the treasury stock of Indra was reduced to 275 shares (CNMV, 1994b).

One element of the restructuring concerned the labor facet and consisted of staff readjustments, the first of which took place as early as 1993 and which was extended until 1997

with the aim of ensuring the viability of the activities. Exceptionally, certain sections were able to keep employment at least at the levels previous to restructuring. This was the case at the Aranjuez Armaments Systems and Equipment Plant thanks to Hughes' participation in Indra's Armament Systems and Equipment business (El País, 1994). Until 2001, the initial level of the company was not exceeded (Figure 1) and thereafter employment tended to grow, more tenuously at the beginning and more accentuated after.

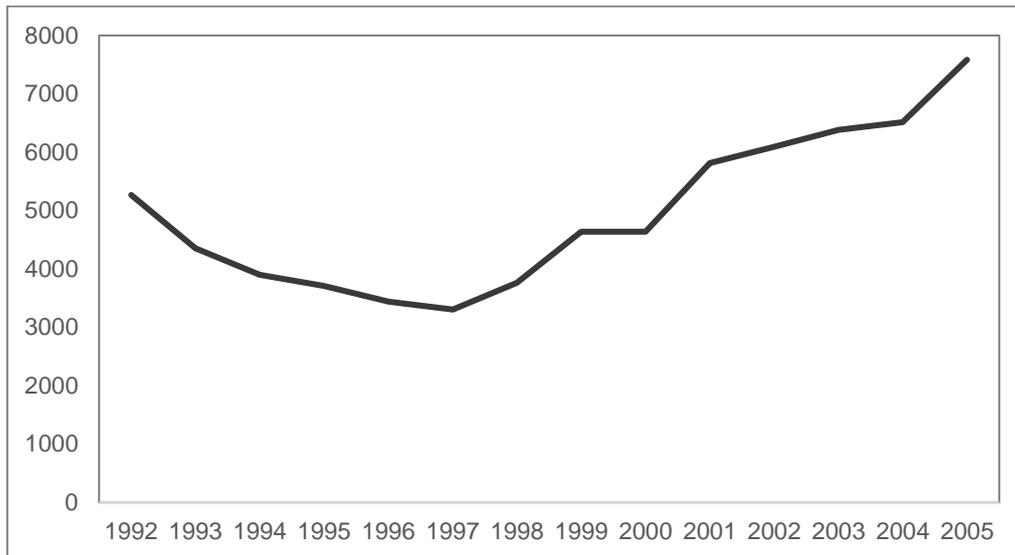


Figure 1. Evolution of the employment at Indra, 1992-2005

Source: Own elaboration from Indra (1992 and 2005)

The fact is that the large files of employment regulation would reach around 2015 had poor visibility in the press and media. On the contrary, a preliminary agreement was reached from ERITEL (Indra Group) with the legal representation of the workers for the restructuring of the workforce, which included a cut of one hundred and a half jobs. Shortly after, the social capital was shortened to by reduction of the nominal value of the shares (CNMV, 1994b).

For transmissions and acquisitions of equity interests, Indra Sistemas signed sale agreements with the public company Empresa Nacional Bazán, which resulted in the sale of SAES CAPITAL shares representing 2% of the capital held by CESELSA, S.A. As a result of this purchase and sale, the share capital of SAES Capital was distributed between Bazán and CESELSA at 51/49%. For its part, Indra Sistemas sold to SAES CAPITAL shares representing 50% of the capital of SAINSEL, with which the share capital of said company was distributed between SAINCO and SAES CAPITAL in equal numbers (CNMV, 1994c).

In the chapter on operations and guarantees on assets, Indra entered into negotiations with Telefónica de España seeking a change in the respective shareholdings in Amper, which made Indra the first shareholder of Amper with a limit of 25%. Soon after, Indra took full control of Amper in a three-way operation, in which the Ministry of Industry also intervened. Significantly, a leftwing representative stressed that Telefónica had abandoned its traditional closure to not care what happened in the Amper Group and that Indra had adopted a similar attitude with its idea of "letting go shares" in the group.

At the beginning of 1995, the first estimates of the result of the last financial year caused Indra to be afraid of its financial situation, due to the high possibility that own funds would fall below half of the share capital. The main shareholder of Indra, Teneo, was fully in favor of guaranteeing the continuity of the company and of subscribing the necessary capital increase even if the remaining shareholders did not do so. Indra dismissed the liquidation case and anticipated the announcement of the general meeting to which the capital increase agreement would be submitted. A capital reduction to compensate losses was not excluded to propose to the Shareholders' Meeting, prior to the extension (CNMV, 1995).

The following year, the subsidiaries ENOSA and Guiado y Control, S.A. -Gyconsa-, a joint venture between the US multinational Hughes and the INI, merged by absorption of Gyconsa by the first (CNMV, 1996).

As regards operations and guarantees on assets, at the end of 1997, the Indra Group acquired half of the capital of Tecnología Informática Avanzada, S.A. (TIASA), specialized in the development of systems and the provision of computer services. This company was acquired from the Advent International Group, with whom the corresponding shareholder agreements were formalized, which included an option to acquire from the Advent the remaining 50% of the capital of TIASA. In making this acquisition, Indra set itself the objective of strengthening its market position and its growth expectations in the short and medium term, guidance that would be ratified shortly afterwards, as we shall see (CNMV, 1997; Indra, 1999).

A part of the restructuring took the form of transformations, mergers, splits and dissolutions, which were concentrated in 1998. Strictly speaking, they are part of a movement to simplify the internal structure, rationalization of assets (GDI, SAINCO and Amper sales; of ENSA and acquisition of all shares of Indra SSI) and reorganization of its legal structure (absorption by Indra Sistemas of Indra SSI (formerly ERITEL), of Indra SCA (former Disel and Indra DTD (former Indra Espacio SA) (Indra Sistemas, 1999).

Despite a previous denial, in mid-1998 Indra Sistemas S.A. and Telefónica S.A. they formalized a contract according to which Indra disinvested in AMPER in a cross-share operation. Indra Sistemas sold to Telefonica 9.4% of the capital of this company and bought from the operator 36.56% of the share capital of Indra SSI, SA, an operation that made Indra the absolute owner of said subsidiary, which, together with Indra SCA and Indra DTD, was absorbed by the matrix, as we will see later (CNMV, 1998, 1999). For legal purposes Indra changed the name of the four flagship companies -ERITEL, CESELSA, Disel and INISEL Espacio- to INDRA SSI, Sociedad Anónima, Indra SCA, S.A., Indra DTD and Indra Espacio S.A., the new names merely denoting the business carried out by each company. The remaining companies of the group kept their previous registered name and the identification of corporate signs, which evidenced the connection with Indra. The year 1998 ended with the approval of the Technological Adaptation Plan to the year 2000 and, a few days later, Indra Sistemas S.A. presented to the financial analysts, in the framework of the current IPO, data on the closing of the 1998 financial year. Indra declared then 85,494 million Pesetas of income and 3,411 of net profit (CNMV, 1998, 1999).

Although in smaller numbers, 1999 was also full of operations, which ratified the policy of selective acquisitions. In the first seven months of the year, INDRA SISTEMAS S.A. acquired stakes of various amounts in four companies. In detail, it was about the acquisition of the 50% that Aerolíneas Argentinas held in INDRA SI until completing the 100% stake in said company. The same movement and result was repeated with TIASA, with the particularity that the six fully owned subsidiaries of TIASA were also integrated into Indra. In the case of the Company Document Base Group (Base Documental de Empresa, BDE), specialized in the electronic processing of documents, and of Diagram Financial and Insurance Products Spain, specialized software for the capital market and fund management, Indra bought all of the actions. Likewise, it took a strategic 10% stake in the capital of Safelayer, an expert in e-commerce security and key to the development of Internet-based services. In greenfield investments, towards the end of 1999, Indra intervened with a 26% stake in the constitution of Eurofighter Simulation System GmbH, dedicated to the transformation of aircraft and the development and production of simulators for the EF-2000 aircraft (Indra, 1999).

The crowning touch of the corporate operations was the public offering for the sale of shares of Indra Sistemas, S.A. It was opened with the agreement in principle between the State Industrial Participation Company (Sociedad Estatal de Participaciones Industriales, SEPI, owner of 66.09% of Indra Sistemas, S.A.) and Thomson-CSF to address Indra's privatization process (Cuervo, 1997; CNMV, 1998). By a syndicate agreement between Thomson CSF, Caja Madrid and Banco Zaragozano, the latter acquired Thomson-CSF shares of Indra Sistemas, SA (CNMV, 1999). In the public offering, Caja Madrid and Banco Zaragozano acquired 10.5% and 4% of INDRA, respectively, and the participation of Thomson-CSF was reduced to 10.5% (CNMV, 1999). The SEPI definitively assigned Indra's shares to three different tranches giving superiority to the Spanish offer -17,555.936 shares- and distributing the rest among several tranches -retail

sub-section of employees: 1.72 million, Spanish institutional tranche: 10,255,898 and international offer. The European Commission gave authorization noting that, after the transaction, the joint voting rights of Thomson/Banco Zaragozano/Caja Madrid represented 25% less one share of Indra's total voting rights and that the aggregate volume of business of the partners in nothing threatened the single market (European Commission, 1999).

In 1999, following the privatization of Indra, the foreign industrial partner Thomson CSF and the two Spanish financial entities allied in a shareholders' agreement with the aim of forming a stable group in Indra. The agreement included mechanisms of shareholding stability between the parties and consensus to guarantee stable management. The first were based on the relevance of the partners and the second on a common position in the appointment of members and board of directors, as well as in agreements on strategic matters, including business plans. Indra did not consider Thomson a technological partner but a preferred shareholder and industrial partner, since it did not transfer its technology to incorporate it into business (Díaz-Varela, 1999; CNMV, 1999).

4. The growth of Indra

Before proceeding, it is convenient to examine the characteristics of Indra in some of its most defining aspects. To start with the productive features, its infrastructure was composed of tangible assets mostly corresponding to plant, machinery and others, with a percentage close to half of the total. The important service component of the company imposed a substantial weight of the data processing equipment (Figure 2). The production centers were scattered throughout the Spanish territory, especially in what we could define as the Madrid cluster, and in some of the foreigners. The most important section of the company -Information and Control Systems- developed its activity in four centers in the Madrid area, four branches in other Spanish cities and one in Buenos Aires. In general, the facilities were not owned by Indra, which in certain cases was under financial leasing, as it was in the industrial municipality of San Fernando de Henares, close to Madrid. Only the building of Electronic Equipment of Defense, located in Aranjuez, near the facilities of INDRA EWS, belonged to Indra (Indra Sistemas, 1999).

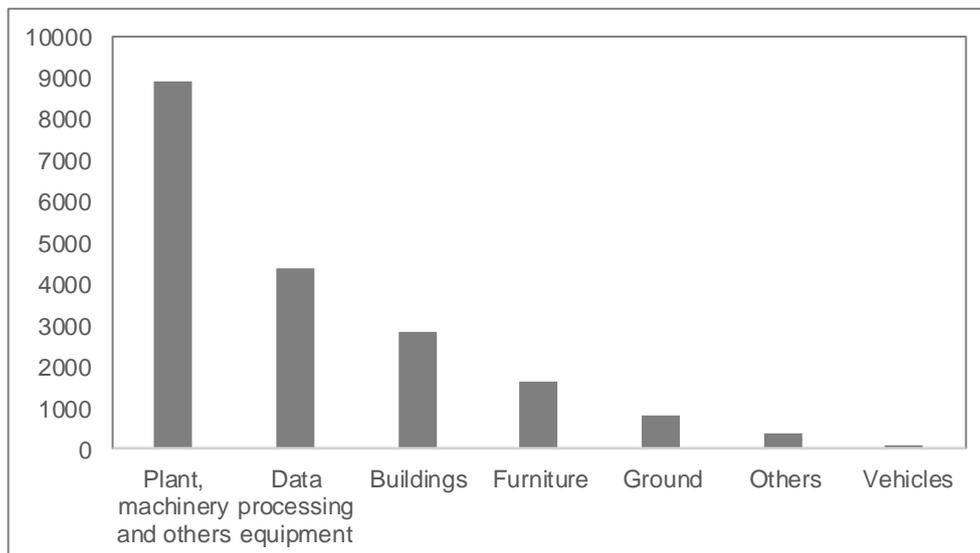


Figure 2. Indra's productive infrastructure. Tangible asset, 1997 (millions Ptas.)
 Source: Own elaboration from Indra (1998)

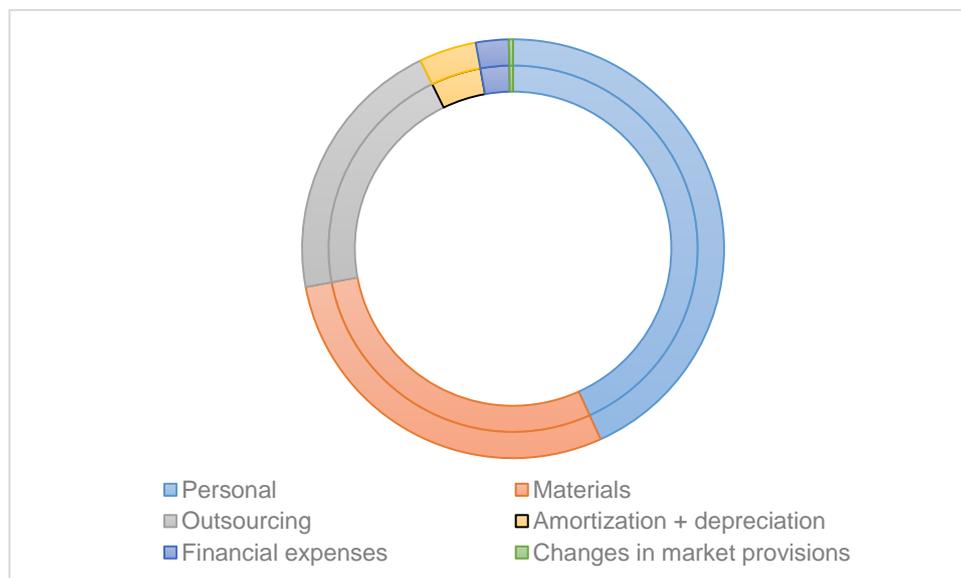


Figure 3. Cost structure of Indra (millions ptas.), 1997

Source: Own elaboration from Indra (1998)

Indra presented a composition of costs marked by the clear predominance of operating expenses and, within these, those of personnel with 13.7% of the total, followed by materials with 9.8%. The second aspect to be highlighted is the use of external work or subcontracting of part of the production, estimated at 2.08% (Figure 3).

At the end of the 1990s, the structure of the Group's ordinary activities by area was clearly dominated by information technologies through the Information and Control Systems (SIC) section (79.1%), while electronic defense equipment and simulation solutions and automatic maintenance systems accounted for 14% and 6.9%, respectively. The breakdown of the business of the SIC section gave an overwhelming predominance of systems integration solutions (83.31% in 1998), a percentage that left a very limited space for technical assistance and outsourcing. The geographic variable of the market added special connotations: the information technologies were destined mainly to the internal market, while the preferred destination of the two remaining ones was the foreign market (Indra Sistemas, 1999). Overall, the bulk of sales was placed in the internal market with a diversified clientele formed mainly by the Spanish public sector in its variants of State -mainly the Ministry of Defense-, autonomous communities and town halls (Indra, 1996). In fact, Indra had a core group of large clients from all sectors of economic and industrial activity, which represented a significant part of the business. Thus, in 1998, the first ten customers added up to 70% of the total revenue. On the other hand, there was no basic nucleus of suppliers, which can be explained by the diversification of the sources of supply and the search for compatibility with other products available in the market².

If we stick to the main section - Information and control systems -, its composition by markets gave pre-eminence to civil and military public administrations, which accounted for more than half of the business, well above, therefore, the remaining markets (Figure 3).

² Here is the list of the ten main customers in 1998: 1. Government of Venezuela 20,814 million Pesetas; 2. Spanish Ministry of Defense 3,571; 3. Telefónica Group 7,436; 4. US Navy 6,725; 5. AENA 4,055; 6. Lockheed Martin GES 2,607; 7. BAZAN 2,435; 8. Eurofighter 1,296; 9. Santa Barbara Armored 1,455 and 10. Government of China 1,139. All of them, except Venezuela and China, belonged to the basic core of customers. The weight of Venezuela was exceptional and corresponded to the concession of the electoral process, which came to represent 24% of the income (Indra Sistemas, 1999).

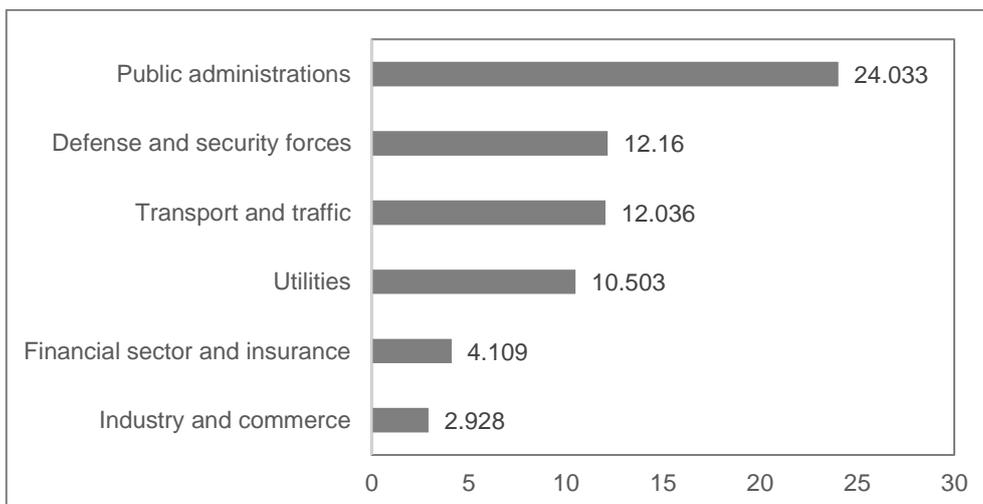


Figure 4. Indra: breakdown of the Information Systems and Market Control section, 1998 (millions pesetas)

Source: Own elaboration from Indra Sistemas (1999)

Indra competed in a sector characterized by business smallholding, which we can bring to light thanks to documents generated by the Public Offer of Sale and the presentation of tenders in bids for services to administrations³. As shown in Table 1, in the Spanish market there were twenty leading information technology companies. The list, which ranges from multinational equipment manufacturers -IBM, Hewlett Packard, Siemens-Nixdorf- to small local companies, is headed by a consultant -Andersen Consulting-, which is followed by Indra. Obviously, the figures do not indicate the size of the companies but the position of the same in the Spanish internal market.

An important issue for Indra was the consolidation of its financial position in the 1990s. Measured by the net debt/net assets ratio, a phase of deterioration in the first half was followed by another of improvement in the second half. This ratio went from values of 71.83% in 1992 to 91.44% two years later to yield up to 35% in 1996 (Indra, 1996).

Undoubtedly, Indra based the lever of its progress on technological independence and, from the outset, devoted significant resources to the activities of innovation and technological development, which included in the first place innovation, carried out for specific projects requested by national or international clients. Secondly, R&D was allocated to future products or developments of the GROUP. It thus managed to generate and develop his own technology with recognized results in the official and private sphere, both nationally and internationally, without the need to obtain and register patents or own brands for each and every one of the systems and solutions offered. In 1996-1999, the INDRA Group allocated to the total R&D activity 7.3%, 9.2%, 9% and 9% of revenues. The denial of independence with regard to external technical assistance does not seem to be in line with reality, as indicated by its participation in R&D programs and the recognition of contributions of external know-how, indicated elsewhere (Indra Sistemas, 1999).

³ The principles, norms and obligatory mechanisms tending to promote the transparency and non-discrimination that the European Commission advocated did not arrive until 1998 (European Commission, 1998). Indra obtained substantial aid and public contracts, especially under the mandate of the president of the autonomous government of Jordi Pujol, linked by family ties to the Europraxis consultancy, sold in 1999 to Indra. To limit ourselves to the case of the Generalitat of Catalonia, the Court of Auditors in Catalonia (Sindicatura de Cuentas de Catalunya, 2004) details the numerous companies that opted for the provision of services.

Table 1. Main companies of the Technologies of the Information in the Spanish market, 1999

Company	Sales (millions of Pesetas)	%
Andersen Consulting	44,708	19.9
Indra	35,127	15.6
IBM	28,749	12.8
EDS	20,000	8.9
Informática El Corte Inglés	13,312	5.9
Sema Group	12,774	5.7
Coritel	11,144	5.0
Group CP	10,800	4.8
Cap Gemini	8,000	3.6
Hewlett-Packard	7,000	3.1
Digital	6,910	3.1
Software AG	5,346	2.4
Oracle	3,820	1.7
NCR	3,200	1.4
Bull Group	3,096	1.4
Unisys	2,791	1.2
Sun Microsystems	2,520	1.1
Dinsa	1,776	0.8
Semicro	1,350	0.6
Siemens-Nixdorf	800	0.4
Other	1,653	0.7
TOTAL	224,876	100.0

Source: Own elaboration from Indra Sistemas (1999)

The INDRA group's R&D strategy focused on adjusting technological development to business strategies and, more specifically, based primarily on enhancing systems engineering as a differentiating element. Second, it sought to optimize investments in technology subject to risk, the profitability of the projects and the availability of resources. Finally, it endeavored to maximize the potential synergies and the use of horizontal technologies. The selection of the projects was subject to the permanent criterion of developing services and solutions that provide maximum value, functionality and quality. As a normal practice, the INDRA Group participated in the main national and international R&D programs. The innovation and technological development activities were complemented by the know-how and experience provided by the groups of experts in key technologies. In terms of financing, R&D projects benefited from non-refundable grants. From the first moments, the INDRA Group received this type of aid from various agencies, including the European Union and the Ministry of Industry and Energy (MINER).

Table 2. Composition of Indra's intangible assets (millions Pesetas)

	1995	1996
Patents	1,305	1,613
Software	1,157	1,199
R&D expenses	9,678	8,394
Rights assignment assets	2,474	2,455
Other intangible assets	458	358
Total intangible assets	15,072	14,019
Total tangible assets	18,886	18,726

Source: Own elaboration from Indra (1996)

Thus, Indra stood out for its high technological component, based on the investment in physical and human capital. On the one hand, the percentage of intangible assets was higher than tangible or material assets. But in addition, R&D expenditures occupied a very prominent position in the total of intangible assets, facet counteracted by the lower weight of patents, which, as we know, were concentrated in certain systems and solutions (Table 2). On the other hand, the composition of the workforce was characterized by the high percentage of personnel with high specialization and qualification, reinforced by a good number of technical staff and experts (Figure A1 in Appendix). The leadership capacity, based on making innovation the core of its activity, was deepened with the impetus to clustering, which led to collaboration with the University in the transfer of R&D (Martín-de Castro *et al.* 2007). In fact, the 1999 Report explicitly recognized the existence of job exchanges and cooperation agreements with the most qualified Spanish universities and training centers. Likewise, it indicated the adaptation of its structures to reinforce the capacity to attract intellectual capital and develop knowledge management (Indra, 1999).

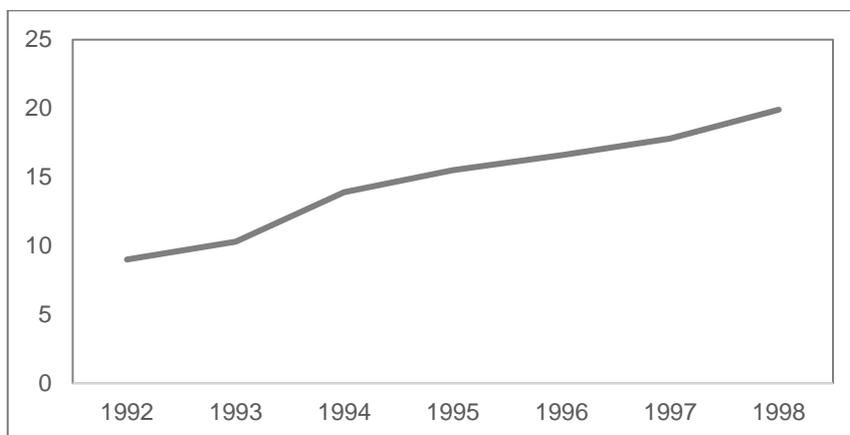


Figure 5. Productivity of the Indra Group (income / employee, millions Ptas.)
 Source: Own elaboration from Indra (1992 and 1998)

The R&D policy was reflected in the increase in productivity. Measured in income per employee, it more than doubled between 1992 and 1998, from nine million Ptas. to nineteen. In 1998, Indra showed an increase in productivity compared to 1995 (from 15.5 to 19 million Pesetas/employee) and performance from operations (from 4,319 to 19,000). Its R&D&i stood at 9.5% of the income and the qualification of the workforce at a high level (75% of highly specialized graduates). The revenue structure gave it a diversified company profile, since, not including those from the foreign market, defense (29%) predominated, followed by transport and traffic (15%), telecommunications (13%), finance and industry (8%) and, finally, energy, environment and others (6%) (Indra/Thomson-CSF, 1998). This differentiated company profile was maintained over time and the significant presence of vertical markets lasted: in 2009, 11% corresponded to telecommunications and media and the internal market represented 64% (Indra, 2009). In a comparative view, Indra's profitability was clearly and permanently higher than that of the European IT sector, as Figure 6 shows.

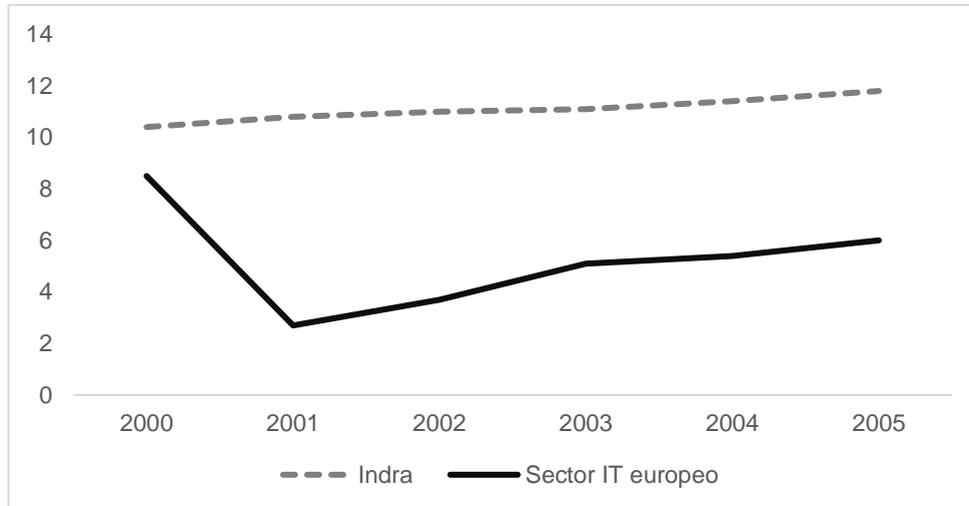


Figure 6. Indra's profitability in comparative perspective (%)

Source: Own elaboration from Cheuvreux (2005)

5. The internationalization of Indra

There are several patterns in the international expansion of companies. Some started it following the steps of its clients in the international markets to provide them with service and ensure the continuity of the commercial relationship. These include Indra, as well as Ficosa and a group of companies in the financial services sector (Santander Group and BBVA). Indra, together with Desigual in the clothing sector and Abertis in the telecommunications, stands out among the companies with an early global brand (Oroval and Varela, 2012).

Generally, there is often a bit of schematism when defining periods in the evolution of companies. This is what happens when scholars date the start of the internationalization of Indra from 2002 onwards. Actually, we can talk about previous dates for a very simple reason: INISEL and, above all, CESELSA, predecessors of Indra, were already international companies.

It is worth pausing to consider the second. CESELSA had its roots in the professional electronics division of CECSA (Compañía de Electrónica y Comunicaciones, SA), a Barcelona-based consumer electronics company established in 1962 as a television manufacturer, which, in 1977, participated in the Spanish defense program -Combat Grande- as subcontractor of the North American multinational Hughes Aircraft in a plant near Madrid. In the final phase of the project, CECSA entrusted the industrial engineer Pérez-Nievas, with extensive training abroad - Harvard, Paris and an internship in Germany-, with the design of the future strategy of the company and the responsibility of the defense specialty. Once the military program ended in 1978, the opportunities presented by the facilities and a drastically reduced but qualified and absolutely available staff advised an action plan based on the development of their own technology and product. Despite the reluctance of unions and some shareholders, CECSA accepted the plan of its manager, which granted two years of trial during which the company began to develop small systems for civil aviation. The company placed its horizon in a role of subcontractor of some multinational (García-Hoz, 2013).

In 1979, at the end of that test period, CECSA faced a corporate restructuring and was split into two completely different companies with independent management and headquarters - CECSA, in Barcelona, and CECSA Sistemas Electrónicos, in Madrid. Its corporate purpose was to design, develop and manufacture electronic equipment for airports, radar data project and flight plan process. CECSA belonged successively to the Catalan Industrial Corporation, to two energy companies - Hydroelectric of Catalonia and Catalana de Gas - and to the Sociedad Madrileña Inversora. The competition of Japanese multinationals in consumer electronics caused difficulties after 1982, suspension of payments due to financial strangulation and bankruptcy in 1984. Its financial bottlenecks emanated from the failure of a major export operation to Europe, which

crashed against type approval problems, in fact non-tariff protectionist barriers. The suspension sought a reconversion of the structure under the recent policy of reindustrialization. One of the ways out was an agreement with Cahué Industrial, manufacturer of Vanguard (Vidal-Folch, 1984). Then, it was renamed Spanish Company of Electronic Systems SA (Compañía Española de Sistemas Electrónicos, S.A., CESELSA). The following year, the company experienced several major movements. It began to quote on the stock exchange, quadrupled its capital and ceded ten percent of it to the French bank Paribas, which became CESELSA's "merchandising bank" in Europe and, ultimately, to the platform that would eventually allow the company to enter the European market. The alliances were not always stable. This happened with a collaboration agreement that CESELSA and Israel Aircraft Industries (IAI) signed in 1986 to present themselves for the revision of the Mirage 3, broken after demanding a Spanish bid defense and forcing the constitution of the Attorn consortium between CESELSA and Construcciones Aeronáuticas (CASA).

After the entry of Spain into the EEC and to achieve critical mass in the single market, CESELSA began in 1987 to create a group of companies with a majority stake in two companies in aeronautics and electronics - Aeronautics Industrial (Aeronáutica Industrial, AISA) and in the already mentioned ENSA Electronics, belonging to a British group and a major Japanese company, respectively.

Driven by the change in the world scenario that has already been pointed out before - end of the cold war and falling demand - since 1987 CESELSA has allied with foreign companies to achieve international scope, within a policy of diversification. This sought participation of different degree in existing companies, as occurred with the minority entry of 45% in the French Giravions Dorand. This holding, involved in production of simulation equipment and especially ballistic simulation, was composed of several companies, including Giravions Industries and Delsi, specialized in the manufacture of missile simulators and in the development of analytical and measuring instruments. Next, it came to the joint ventures with sector leaders through a controlling or minority stake. Aeronautical Systems Designers, specialized in civil simulation software, created in 1990 in association with 65/35% with the British SD-SCICON, name adopted by the British Systems Designers PLC once it acquired the North American Scicon Group and became one of the most important companies in the world in the development of civil simulation software.

In 1991, CESELSA concluded an agreement with the North American electronics group Raytheon to jointly enter the international market and present joint offers. Among the actions of CESELSA, they highlighted the development of flight plan treatment subsystems and traffic control simulators (UPI, 1991).

CESELSA focused its expansion-diversification strategy on its technological control over certain activities, according to the "technological tree" model, applied by Japanese multinationals, including Mitsubishi, Yew and Nippon Steel. The aim was to create a coherent and solid capacity through highly diversified products offered in international markets. The growing sophistication and high cost of research which derived from considerable competition and technological potential required to share risks through a collaboration with other companies. CESELSA forged alliances and participations in European programs of technological cooperation, such as the HTA project (Hermes Training Aircraft) -looking for the definition of the training aircraft that was to be used to simulate the final approach and landing phase of the shuttle Hermes together with several companies -Dassault Aviation, Deutsche Airbus, Sabera Technics and Dornier. CESELSA based its strategy on concentration - concentrating its resources on basic technologies for its development - and looking for satellites - joint ventures to enter new markets with new industrial branches. In this way, CESELSA improved its business flexibility without incurring restructuring problems.

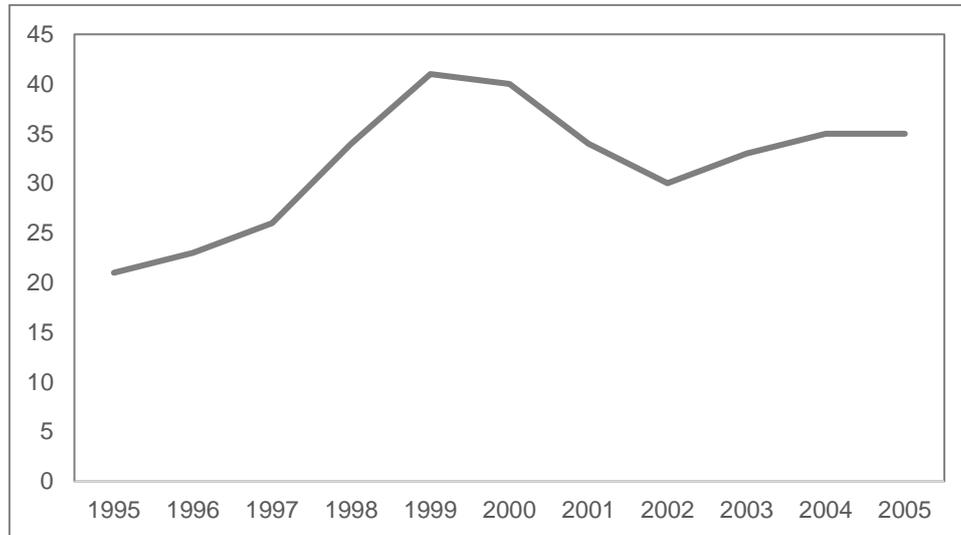


Figure 7. Indra's internationalization: sales in the international market (%)

Source: Own elaboration from Indra (1995 and 2006)

The dates of internationalization of Indra are also anticipated to those maintained by some specialists taking into account one of the usual arguments, namely the penetration in the world market. Towards the end of the 1990s, Indra presented a growing and geographically diversified international presence, with figures ranging from 21-29% of revenues (Figure 7), 34-45% of recruitment and 26-40% from the portfolio. The breakdown of international sales by geographic area gave a predominance of the Latin American market, which seemed to displace the North American from the second position, after the internal market (Indra Sistemas, 1999).

Indra started the exit abroad as a direct investor with the constitution of its first international subsidiary in Argentina in 1994, with the far-reaching name of Indra América. The signing of a contract to carry out the outsourcing of the information systems of Aerolíneas Argentinas opened new ways of penetration in the country. The contract, amounting to 90 million dollars-, included the development and maintenance of software, the control and operations of the data processing center and the service to users (Indra, 1996; ComputerWorld, 1996). The Argentine pioneer was followed in 1997 by a second in the same country -Indra SI- and soon new subsidiaries were added in such extreme places as the Philippines, Brazil, China, the US -Indra Systems- and the Czech Republic. Some of these episodes demand special attention.

The entry into Brazil followed a significant gradation, which invites dialogue with the theories of the internationalization of companies. First were the projects and the export of technology and then came the turn of the offices, direct investment in production and sales. The sequence continued with the design and export to neighboring countries (Díaz, 2010; Indra Sistemas, 2000).

Among the strategic alliances, it stands out for its early character carried out from the National Company of Optics (ENOSA) with Hughes, where the American multinational acquired 40% of the capital (El País, 1994). Classified among operations and guarantees on assets, in 1997 the Indra Group formalized with the North American Raytheon Company, with which it had already collaborated for years before, the constitution of a company called Indra ATM, SL, in which they participated in a 51 % and 49%, respectively. Framed in a Joint Venture Agreement, the purpose of the new company was the development and export of systems and applications for air traffic control. The agreement involved a division of responsibilities for which Indra was entrusted with the provision of technological capacity together with the management, while Raytheon reserved the commercial paper. The agreements for the creation of this joint venture involved the establishment of the registered office in Spain - the Madrid town of Torrejón de Ardoz - and also the payment to Indra by Raytheon of 8.5 million Dollars. For his part, Raytheon was gaining time while awaiting a decision on his offer to acquire the defense operations of Hughes

Electronics Corp. For the new company, it went over the name of Indra-Raytheon and its value was estimated at 41.6 million Dollars (Prada, 1997; CNMV, 1997). Over time, INDRA acquired 49% of the shareholding in ATM, which became a wholly owned subsidiary. When the joint venture was wound up and started its own career after eight years of partnership, Indra made a 'very positive' balance, both due to the high joint annual rate of increase in revenues -30% - and its capacity to break into the international market with proprietary designed air traffic management systems⁴.

Entry into China via foreign direct investment presents several elements of interest. To begin with, Indra secured a presence started with several projects years ago and a permanent business establishment in Beijing together with a technical office in Nanjing. This entry basis had not been enough to channel the growing business or take advantage of the high growth of the economy and the opportunities in information technology and infrastructure. From there, the consolidation of the organic structure began with the presence of Indra Sistemas in 2000. The new Indra Beijing IT Systems offered two years later a local platform that would favor the execution of projects both in that business area and in other activities and ensure technical, after-sales and maintenance support. On the other hand, the creation of the company coincided with the achievement of a contract for the development of a flight simulation center for a Chinese company.

Not other than internationalization can be considered technical, industrial and commercial cooperation agreements with the aim of strengthening competitiveness deepening those sealed four years earlier with Thomson-CSF. They hinged on the principles of technological cooperation, including joint R&D, exchange of professionals and technicians, as well as Indra's access to new international programs. Essential pieces were, in turn, the new businesses of common interest, to streamline and increase the efficiency of common operating procedures and the respect of other existing agreements with third parties. The agreement meant assigning capacities to the partner in the areas of preferential interest, that is, to Thomson-CSF the simulation area and to Indra that of automatic maintenance systems. Other areas of priority interest were added to them: communications; radar, command and control; electronic warfare and weapons control systems (CNMV, 1999; Indra/Thomson-CSF, 1998).

6. Conclusion

This research comes back to the debate and questions the positions contrary to the intervention of the State in the economy, which they consider a disastrous allocation of resources. It also mediates in the international discussions showing that ICTs are a factor with strong potential for growth and development opportunities. It is based on the case of the emblematic company Indra, an example of the coexistence of public and private capital. The association of the private company and the public sector, not always easy, nor generally seen well by analysts, theoreticians and politicians, especially among those related to the neoliberal current. This company has cultivated as few a clear image of a vanguard company - innovative, dynamic, internationalized and committed to the future - and raised the banner of technological independence. The study shows the keys to the birth and development of Indra: its restructuring, its external expansion and above all its commitment to investment. Even today Indra claims: "Our ordinary business contributes to the creation of wealth by generating solutions and services as well as the distinguishing characteristic that sets the company apart: innovation. This is of crucial importance because innovation is essential for the economy and an indispensable requirement for social development". The study questions some theories that deny effectiveness to public

⁴ The amount paid was 58.6 million Dollars (equivalent to 48.7 million Euros). Indra ATM developed the flight system for the German air navigation authority for 18 million Euros, developed the new generation of air traffic management systems of the pan-European control center in Maastricht, commissioned by the European Aviation Safety Agency (EASA) (Baena, 2005). Already in 1999, Indra obtained important contracts for air traffic management systems in Europe (Germany), Russia and Latin America (Nicaragua and Chile) (Ministerio de Industria y Energía, 2001).

investment, on the one hand, and that pigeonholed the internationalization of companies in rigid schemes, on the other.

Obviously, the closeness of the story to the early years of the company and the restrictions on access to primary sources imposed by the proximity of events impose limits on these conclusions. An extension of the chronology and the desirable availability of the company's files will provide more elements, especially about the characteristics of the chosen strategy, and will allow us to conclude whether this strategy was correct.

References

- Ablett, J. and Erdmann, A., 2013. *Strategy, scenarios, and the global shift in defense power*. New York: McKinsey.
- Anthony, I., ed., 1994. *The future of the defence industries in Central and Eastern Europe*. Oxford: Oxford University Press.
- Baena, J. C., 2005. *Comunicado a la Comisión Nacional del Mercado de Valores* [Statement to the National Securities Market Commission]. 29 December, Madrid.
- BIT, 1992. Javier Monzón, presidente del nuevo holding Ceselsa-Inisel. [Javier Monzón, president of the new holding Ceselsa-Inisel], *BIT*, 77, pp. 23-25.
- Calvo, A., 2019. Sector privado y sector público en la industria española de alta tecnología: Indra [Private sector and public sector in the Spanish high-tech industry: INDRA], *Biblio3W, Revista Bibliográfica de Geografía y Ciencias Sociales*, XXIV, 1.259, January.
- CNMV, 1991. *Relevant facts*. 27 September 1991.
- CNMV, 1992. *Relevant facts*. 18 June 1992.
- CNMV, 1993. *Relevant facts*. 8 June 1993.
- CNMV, 1994a. *Relevant facts*. 11 February 1994.
- CNMV, 1994b. *Relevant facts*. 22 and 30 March; 23 May and 22 April 1994.
- CNMV, 1994c. *Relevant facts*. 10 and 14 November 1994.
- CNMV, 1995. *Relevant facts*. 14 February 1995.
- CNMV, 1996. *Relevant facts*. 9 October 1996.
- CNMV, 1997. *Relevant facts*. 3 December 1997.
- CNMV, 1998. *Relevant facts*. 4 May; 25 June; 30 December and 2 October 1998.
- CNMV, 1999. *Relevant facts*. 3, 16 and 26 February 1999.
- ComputerWorld, 1996. Indra firma un contrato de outsourcing con Aerolíneas Argentinas [Indra signs an outsourcing contract with Aerolíneas Argentinas]. *ComputerWorld*, 22 November 1996. [online] Accessed at: <<https://www.computerworld.es/outsourcing/indra-firma-un-contrato-de-outsourcing-con-aerolineas-argentinas>> [Accessed on 10 February 2019].
- Cuervo, A., 1997. *La privatización de la empresa pública* [The privatization of the public company]. Madrid: Encuentro.
- Chevroux, 2005. *European IT and Technology Conference*. Paris, March 16 2005. Paris: Chevroux.
- David, P., 1991. Computer and dynamo. The modern productivity paradox in a not too distant mirror. In: OECD, ed. 1991. *Technology and productivity: The challenge for economic policy*. Paris: OECD. pp. 315–48.
- El País, 1994. Indra mantiene 500 empleos en Aranjuez por la inversión de una multinacional. [Indra maintains 500 jobs in Aranjuez due to the investment of a multinational company]. *El País*, 3 January 1994, nd.
- Díaz, E., 2010. Brasil: Un gran mercado con futuro [Brazil: A great market with a future]. In: G., Solana, ed., 2010. *Brasil: Un gran mercado en expansión sostenida* [Brazil: A large market in sustained expansion]. Madrid: Publishing Services. pp. 143-146.
- Díaz-Varela, M., 1999. Entrevista a Javier Monzón, presidente de Indra [Interview with Javier Monzón, Chairman of Indra], *La Vanguardia*, March 1st 1999, p. 52.
- Digiovanna, S. M. and Markusen, A., ed., 2004. *From defense to development? International perspectives on realizing the peace dividend*. New York: Routledge. <https://doi.org/10.4324/9780203300664>

- European Commission, 1998. *Communication from the Commission COM (98) 143, 11 March, Public procurement in the European Union*. Brussels, p. 25-26.
- European Commission, 1999. Regulation (EEC) No 4,064/89, Merger Procedure, 05/05/1999. Case No IV/M.1479 -Thomson / Banco Zaragozano / Caja Madrid / Indra.
- European Commission, 2009. *Defence industry. Comprehensive sectoral analysis of emerging competences and economic activities in the European Union*. Brussels: Directorate-General for Employment, Social Affairs and Equal Opportunities.
- Freedman, L., 1999. *The politics of British defence 1979-98*. Houndmills: Macmillan. <https://doi.org/10.1007/978-1-349-14957-5>
- García-Hoz, J. M., 2013. José Antonio Pérez-Nievas, o cómo cortar las alas a la tecnología española [José Antonio Pérez-Nievas, or how to cut the wings of Spanish technology]. *Expansión*, January 12.
- Granrut, C. D., 1990. L'industrie électronique européenne de défense [The European electronics defense industry]. *Futuribles*, 142, pp. 29-57.
- Hayward, K., 2009. The globalization of defense industries. In: R. A., Bitzinger, ed. 2009. *The modern defense industry: Political, economic, and technological issues*, ABC-CLIO, Santa Barbara CA, 2009, p. 107-122.
- Indra, 1992. *Annual report 1992*. Madrid: Indra.
- Indra, 1996. *Informe anual de gobierno corporativo [Annual report on corporate governance]*. Madrid: Indra.
- Indra, 1998. *Activity report*. Madrid: Indra.
- Indra, 1999. *Informe de actividades [Activity report]*. Madrid: Indra.
- Indra, 2006. *Presentación corporativa [Corporate presentation]*. Madrid: UNED.
- Indra, 2009. *Informe de actividades [Activity report]*, Madrid: Indra.
- Indra Sistemas, 1993. *Cuentas anuales e Informe de gestión a 31 de diciembre de 1993 [Annual Accounts and Management Report as of December 31]*. Madrid: Indra.
- Indra Sistemas, 1999. *Tríptico informativo, oferta pública de venta de acciones de Indra Sistemas, S.A. formulada por Sociedad Estatal de Participaciones Industriales y Cofivacasa S.A.* [Informative triptych, public offer of sale of shares of Indra Sistemas, S.A. formulated by State Company of Industrial Participations and Cofivacasa S.A.]. March.
- Indra Sistemas, 2000. *Informe público Anual 2000 [Annual Public Report 2000]*. Madrid: Indra.
- Indra/Thomson-CSF, 1998. *Un proyecto industrial consolidado. Plan industrial. Cooperación [A consolidated industrial project. Industrial plan. Cooperation]*. Madrid: SEPI.
- Johanson, J. and Vahlne, J. E., 1977. The internationalization process of the firm. A model of knowledge-development and increasing foreign commitment. *Journal of International Business Studies*, 8(1), pp. 23-32. <https://doi.org/10.1057/palgrave.jibs.8490676>
- Johanson, J. and Vahlne, J. E., 1990. The mechanism of internationalization. *International Marketing Review*, 7(4), pp. 11-24. <https://doi.org/10.1108/02651339010137414>
- Johanson, J. and Wiedersheim, P. F., 1975. The internationalisation of the firm-Four Swedish cases. *Journal of Management Studies*, 12(3) pp. 305-322. <https://doi.org/10.1111/j.1467-6486.1975.tb00514.x>
- Martín-de Castro, G., López P. and Murcia, C., 2007. El compromiso de Indra con la innovación como clave de la actividad de la empresa [Indra's commitment to innovation as a key to the company's activity]. *Economía industrial*, 366, 2007, p. 211-219.
- Ministerio de Industria y Energía, 2001. *Informe sobre la industria española 1999-2000: Sectores y empresas industriales [Report on the Spanish industry 1999-2000: Sectors and industrial companies]*. Volume 2, Madrid: MINER.
- Morcillo, P., 1990. *Análisis de la empresa CESELSA [CESELSA company analysis]*. Madrid: CDTI.
- OECD, 2003. *ICT and economic growth evidence from OECD countries, industries and firms*. Paris: OECD Publishing.
- Oroval, J. M. and Varela, A., 2012. *Retos en la internacionalización de las marcas españolas [Challenges in the internationalization of Spanish brands]*. Barcelona: Esade.
- Pareja, C., 2009. *Indra. La experiencia de la internacionalización*, Cursos de verano de la Granda [Indra. The experience of internationalization, Summer courses of the Granda], July.

- Pérez-Nievas, J. A., 2017. *Grupo CE SELSA 10 años creciendo con tecnología española* [CE SELSA Group 10 years growing with Spanish technology]. Madrid: Iberfomento.
- Prada, P., 1997. Raytheon and Indra to form Air-Traffic-Control venture. *Wall Street Journal*, January 14, nd.
- Sindicatura de Cuentas de Cataluña [Court of auditors in Catalonia], 2004. *Informe 21/2004* [Report 21/2004].
- United Nations Conference on Trade and Development, 2005. *Report on the information economy 2005*. New York and Geneva: United Nations.
- UPI, 1991. Raytheon, Ceselsa unite to bid on air traffic control projects, *UPI Archives*, June 25.
- Vidal-Folch, X., 1984. Suspende pagos CECSA-Consumo [CECSA-Consumption suspends payments], *El País*, 3 January.

Appendix

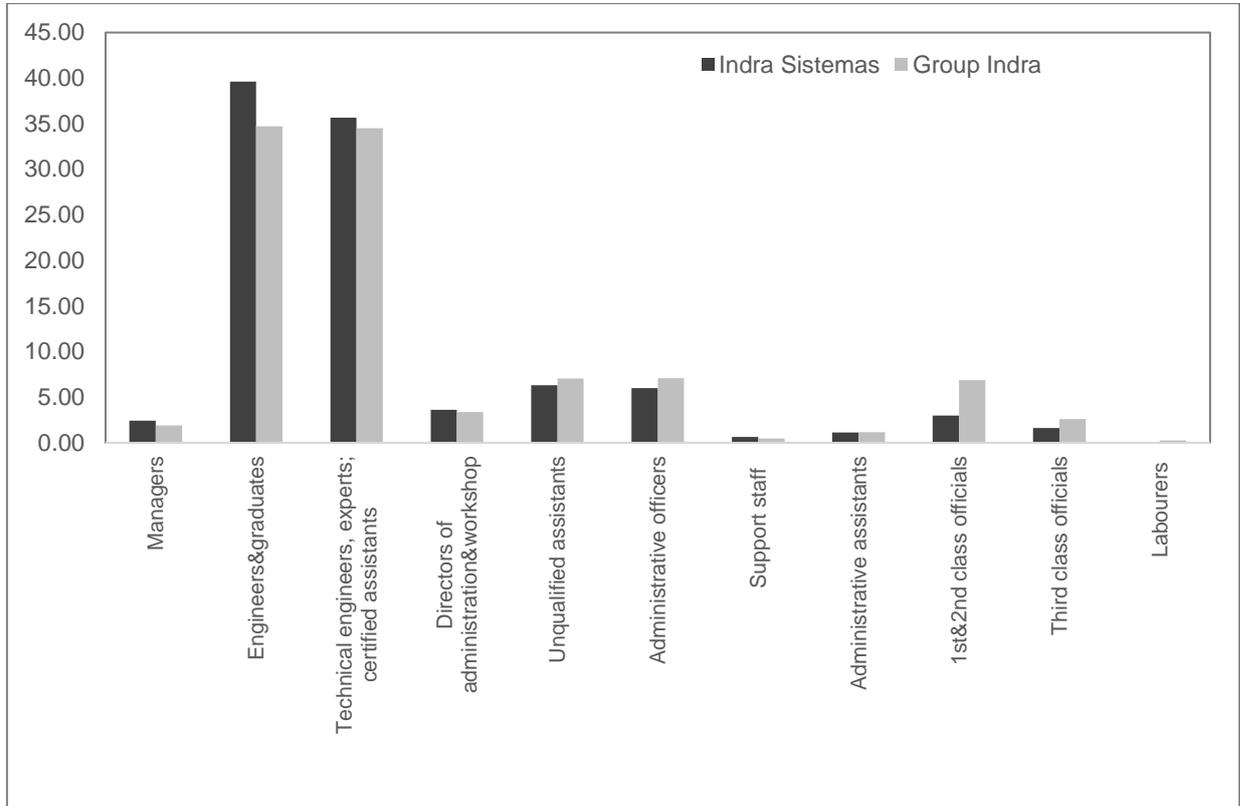


Figure A1. Composition of Indra's average staff by categories, 1998

Source: Own elaboration from Indra Sistemas (1999)