



STRATEGIC DETERMINERS AND FACTORS OF BUSINESS MANAGEMENT RELATED TO THE DEFENCE INDUSTRY

DETERMINANTES ESTRATÉGICOS Y FACTORES DE GESTIÓN RELACIONADOS CON LA INDUSTRIA DE DEFENSA

ANTONIO JUAN BRIONES PEÑALVER

PhD in Management. Collaborating Professor at the Polytechnic University of Cartagena, Spain
Aj.briones@upct.es

Recibido: 10.09.2009 - Aceptado: 05.12.2009

RESUMEN

El siglo XXI presenta un escenario de cambios en materia de seguridad y defensa. En este sentido, las Fuerzas Armadas Españolas (FAS) y los Sistemas de Seguridad y Defensa (SDE), tienen un papel fundamental. Como resultado, las Fuerzas Armadas Españolas están inmersas en una profesionalización y modernización, derivada de la Política Europea de Seguridad y Defensa, los objetivos de las Directivas de Defensa Nacional, y las Revisiones Estratégicas de Defensa. Esta situación, hace necesario contar con empresas relacionadas con la industria de defensa que favorezcan el nuevo modelo de FAS y SDE. Los objetivos de este estudio son: 1) *el análisis de los factores determinantes de la modernización y profesionalización de las FAS, y los SDE*; así como, 2) *el análisis de la posible cooperación del Ministerio de Defensa con Organizaciones Externas*. Con este propósito, establecemos una perspectiva de la Organización de Defensa con ciertas pretensiones de investigación, ligadas al estudio de los objetivos del “Modelo de FAS y los SDE”. Además, tratamos de poner de relieve las posibles dependencias entre aspectos ligados a las variables del “*Enfoque de la Organización de Defensa (EOD)*”, y los resultados del mismo, la innovación y las medidas de excelencia empresarial. Enfocamos el diseño de la investigación hacia el estudio de los determinantes estratégicos y cambios competitivos ocurridos en las compañías relacionadas con la industria de defensa.

PALABRAS CLAVE

Estrategia, Cooperación, Innovación, Excelencia, Calidad, Responsabilidad, Industria de Defensa, Modernización, Cultura de Defensa.

ABSTRACT

The 21st century presents a scenario of challenges in matters of security and defence, in which the *Spanish Armed Forces (FAS)* and the *Defence Systems (SDE)* both play a fundamental role. As a result, the *Spanish Armed Forces* are immersed in professionalisation and modernisation, as derived from the *European Security and Defence Policy*, from the objectives presented in the National Defence Directives, and the Strategic Defence Review. This situation makes it necessary to count on companies related to the defence industry which favour the new model of FAS and SDE. The objectives set out in this study are: 1) *the analysis of the determining factors for the modernisation and professionalisation of the FAS and SDE*; as well as, 2) *the analysis of the possible cooperation of the Ministry of Defence with External Organisations*. We seek to highlight the possible dependence between aspects linked to the variables of the “*Focus for the Organisation of Defence (EOD)*”, and its results, the innovation and the measures of business excellence. We focussed the design of the investigation towards the study of the strategic determiners and the competitive changes which have occurred in the companies related to the defence industry.

KEYWORDS

Strategy, Cooperation, Innovation, Excellency, Quality, Responsibility, Industry of Defense, Modernization, Defence Culture.



1. INTRODUCTION

In recent decades a series of events have occurred which have substantially altered the international scene. At the same time, the 21st century presents a scenario of increasing challenges in matters of security and defence, where peace and the world order are constantly being questioned. For that reason, the Spanish State counts on the *Spanish Armed Forces (FAS)* and the *Defence Systems (SDE)*, with both playing a fundamental role. Similarly, in order to provide a response to the challenges which appear, new obligations and operative requirements in matters of defence. As a result, the Spanish Armed Forces are immersed in a process of professionalisation and modernisation, as derived from the *European Security and Defence Policy*, from the objectives presented in the National Defence Directives, and the Strategic Defence Review.

This situation makes it necessary to count on companies related to the defence industry which favour the new model of FAS and SDE; in order to face these circumstances, the firms must be committed to innovation and to measures of business excellence: quality, and social corporate responsibility; and through inter-organisation relations, inter-company cooperation, and the establishment of strategic alliances, to help the FAS and SDE to reach their objectives. Therefore, this study presents the Focus for the Organisation of Defence (EOD), thinking in the socio-economic and military results what the institutional change in the FAS and the SDE supposes, with repercussions in all fields and which concerns national and international society.

The objectives set out for this study are as follows: 1) *the analysis of the determining factors for the modernisation and professionalisation of the FAS and SDE*; as well as, 2) *the analysis of the possible cooperation of the Ministry of Defence with External Organisations*. To this end, we establish a perspective for the Organisation of Defence with certain investigation aspirations, linked to the study of the objectives of the “FAS Model and the SDE; professionalisation and

modernisation”. Furthermore, we seek to highlight the possible dependence between aspects linked to the variables of the “*Focus for the Organisation of Defence (EOD)*”, and its results, the innovation and the measures of business excellence. With this intention, we focussed the design of the investigation towards the study of the strategic changes established in the SDE, the transformation in the FAS model, and the analysis of the competitive changes which have occurred in the companies related to the defence industry.

2. LITERATURE REVIEW

The investigation has been structured so as to start with general aspects and to work methodologically toward more concrete matters and to reach this purpose, the work has been structured into three parts.

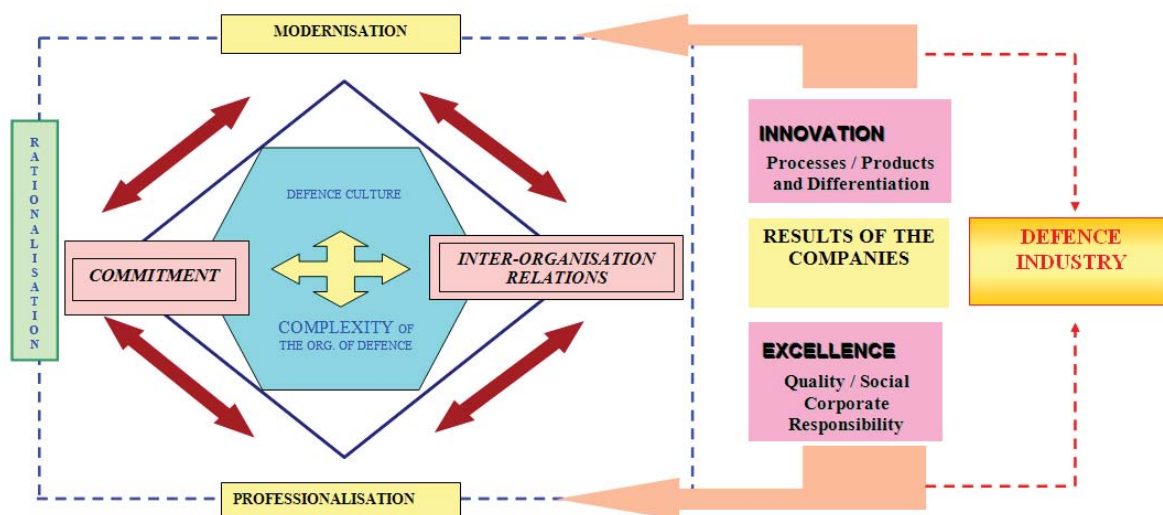
The first part is dedicated to the study of the modernisation and professionalisation of the FAS and SDE starting from the EOD.

In this, the concepts of security and defence are explained, in order to improve their understanding, as well as contributing to justifying the need for the FAS. Likewise, a study is made of the strategic behaviour. This requires an adequate development, for which purpose the so-called National Defence Directives (DDN) have been created.

To do this, National Defence Directives (DDN) 1/96, 1/2000 y 1/2004 are reviewed, since they are what mark the start of the process of modernisation and professionalisation in the FAS. Equally, the role played by the FAS in the international context is intended to be identified. Following that we deal with the institutionalisation of the SDE, for their unquestionable usefulness for the society they serve and which they feed on as well. A short review of the current organisation of National Defence is undertaken, mentioning the principal institutions that integrate the SDE, and analysing their most important functions. Subsequently, the relationship between defence and the economy is dealt with, since both the FAS and the SDE require a series of resources



Figure 1 - New focus for the organization of defence (EOD)



Source: Own Production.

that come from the Spanish Economy, and which are orientated to certain objectives and to achieving them.

In the next section of the study, the aim is to understand the objectives of the new EOD in greater detail (Figure 1), and to know which are the intrinsic factors and the tools that affect their being achieved, as well as the results that are derived from this perspective. To do so the objectives laid down in the EOD are analysed, just as the National Defence Directives state, that is to say, the modernisation and professionalisation, under the principle of rationalisation. The defence culture and the complexity of the Organisation of Defence are then studied, since these two factors intrinsically affect and influence the achievement of the FAS objectives. Then, the commitment and the inter-organisation relations as tools which help to achieve the above-mentioned objectives, are examined. Finally, business innovation and measures of excellence, social corporate responsibility and quality are considered.

The second part is dedicated to the study of the fundamental theories of cooperation and strategic management of the organisations. The fundamental theories that justify the existence of cooperation were studied and which are necessary to our study, from the perspective that connects cooperation with the nature of the business. The study covered five

aspects. The first seeks to define the concept of organisation in its three meanings, for the purpose of offering a clear vision of this term. In the second the Theory of Systems and the Theory of Contingencies and its relation with cooperation are both explored. In the third, the institutional focus is reviewed, dealing with the transformation and the organisational change from this perspective; thus, the isomorphism, its classes and its institutional type of mechanisms for change are examined; as is trust, as a dimension of institutional theory. In the fourth, setting out from an economic focus, the different currents are analysed under the generic name of Economy of Organisations; Theory of the Agency, Economy of Transaction Costs, and Economy of Property Rights. Similarly, each of these theories is dealt with in relation to cooperation, with the objective of determining how these theories affect them. In the fifth, conflict is itself defined, and in relation to cooperation, in addition, the topic of prevention and resolution of conflicts is reviewed, due to its importance for the correct working of the cooperation process.

Subsequently, the theoretical fundamentals which are considered adequate for this study are examined, these permit us to have access to the knowledge of the organisation and inter-company cooperation, through the “strategic focus” in which strategic support is considered.



This supposes a theoretical approximation to the attitude of the company in relation to the decision making process, and the cooperation in the company setting, as a strategic option. Moreover, the resources and capacities are dealt with, stopping in the intangible resources due to their importance as elements that promote sustainable advantage for the organisations.

Equally, cooperation is analysed as a strategic option from the optic of resources and capacities. We can see how the information is transformed into knowledge through the comparison and connection of data, defining both concepts in relation to the organisation; in second place, starting from the analysis of the company based on knowledge, the management of knowledge and intellectual capital are studied, due to the importance that adequate management of this resource has for the organisation; in third place, inter-company cooperation to gain knowledge is examined; that is to say, its acquisition, learning and/or transmission, as well as the conscious management of knowledge and intellectual capital within it. Then, we seek to relate the Information and Communication Technologies (TICs), and the competitive advantage of the companies, and in the same way, the evolution of the Systems of Information (SI/II) for the managers is considered, as is their periodical implantation in companies as a support to the processes of business management and decision. Finally, inter-company cooperation, strategic alliances and in general business collaboration relations are analysed, starting from their consideration as strategic tools.

A review of the concept and processes of inter-company cooperation (also, C.I.) was also carried out to show an overall view. This consisted in eight factors. Firstly, the contributions made by the literature to the concept of cooperation are observed, showing an attempt to define inter-company cooperation and offering a summary of its basic characteristic features, in addition, the strategic character of the cooperation is analysed. The second considers the economic, strategic, and organisational focuses of the decision to cooperate and the principal strategic reasons that lead organisations to adopt

cooperation agreements are specified. Then, the advantages and inconveniences that cooperation agreements can present are described.

Starting from the literature, diverse typologies of cooperation relations between organisations are seen, and then we offer and define a taxonomic proposal of it. Following the classification criteria most used by authors, the agreements are divided depending on the type or form they adopt once signed by the partners in cooperation. Thus, the four resulting types and their components are conceptualised and detailed. A synthesis of the steps to be followed in the cooperation process is made, given the importance that its adequate planning has on the success or failure of the same. For that reason, the formation process; the selection of the partner; the contacts and negotiations; reaching an agreement; the process to manage the agreement; and finally, the factors that determine success in inter-company cooperation are all examined. The previous contributions of the C.I. are reviewed, that is to say, the classifications that we can find in the national and international academic literature, to propose an ordering of the works that have been shown and published most recently; a classification based on the exploration is presented which suggests lines of investigation of the C.I.

Taking into consideration the globalisation of the economy, the society of knowledge and the development of telecommunications, a review of the literature is carried out that leads us, on the one hand, from the internal organisational configuration of the company, to the external organisational configuration, denominated inter-organisational network, and, on the other hand, to consider adequate the utilisation of the means available in relation to the communication and treatment of the information. The first has been dedicated to the study of the organisational models and their changes, which has led us to specify the models in trefoil, federal and in network. In the second, the inter-organisation networks, their concept and typologies appear, as do their different structural designs are represented and explained. In the third, the System of Information (SI) and



Information and Communication Technologies (TICs) are analysed, as is the role that they play in inter-company cooperation, and the (TICs) in the process of formation and management of the cooperation agreement.

3. EMPIRICAL STUDY

- *Population and size of the investigation.*

The defence industry is analysed, as is its industrial panorama, the sectors that constitute it, the companies which supply the Ministry of Defence, the Subcontracting and Externalising the Maintenance in the FAS and SDE, and finally, the location of the companies in science and technological parks. Next, the procedure to obtain the sample of the companies used for the empiric investigation is detailed.

The empirical study covers a population of companies closely related with the Spanish defence industry and takes into consideration the criterion that these were entities of importance in its relationships with the defence and that they maintained commercial relationships on a regular basis with the Ministry of Defence. Such a managerial feature /characteristic makes us think that the target population is of a managerial type and due to its regular and singular relationship to the Organization of Defence.

Our database was offered by the General Addressee of Economic Matters of the Ministry of Defence, with about 9200 notes and including more than enough contracts of all amounts and the supply or relationships with

companies and institutions both in the national as well as the international environment. When we began the research process, there were 7090 contracts signed/made for an amount in excess of 3000 euros between the mentioned Ministry and suppliers during the year of 2003. The organisations hired during that year were compared with other companies hired or which had participated in any kind of support programme of defence during the period between 1991-2000, on at least one occasion. After a thorough analysis of the various designations for the suppliers, managerial groups, we found a population of 450 external organisations to the Ministry of Defence (companies and institutions) of importance for the Department of Economic Affairs of the above-mentioned Ministry in the period corresponding to the years 1991-2003, being that these relationships were maintained for thirteen years.

Finally the investigation was carried out by means of a postal survey during the period between February and August of 2004; 236 complete questionnaires were obtained, unveiling a rate of response of 52.44%, with a margin of error of 4.4% for $p=q=50\%$ and confidence interval of 95.5%. In Table 1, the technical details of the empiric investigation are described:

- *Questionnaire of the Doctoral Thesis.*

For the elaboration of the questionnaire, the previous contacts with the Ministry of Defence as well as with some of the most important companies and institutions related with the defence industry were kept, further

Table 1 - Technical details of the empiric investigation.

Population.	450 companies related to the Defence Industry and/or suppliers to the Ministry of Defence during the period 1991-2000 and in the year 2003. Primary source of information: reports of administrative contracting in the field of the Ministry of Defence during the period 1991-2000, and the Third Parties Archive of the Ministry of Defence 2003.
Data collection.	Structured questionnaire / postal survey.
Size of the investigation.	236 (response rate 52.44%).
Margin of statistic error.	($\pm 4.4\%$), (confidence interval 95.5%)
Date of fieldwork.	February/ August 2004.

Source: Own production



to this, experts were also consulted on matters of administrative recruiting and recruiting of qualified personnel, as well as their relationships with the Spanish Armed forces (FAS and SDE).

The final survey picks up a global study on the strategic determiners for the new perspectives for the Organisation of Defence (from now on, EOD), based on the training strategy as well as on the modernisation of the Armed forces and the Systems of Defence, and the analysis of the cooperation processes with external organisations. The procedure carried out to design the questionnaire is seen and various classifications are proposed in order to study the dimensions of the model of *FAS and SDE*, which are capable of explaining the theoretical propositions of the new EOD, the possible results experienced, as well as the attitudes of the companies related to the defence industry. Our classification scheme for the key factors of the organisational changes with relation to the strategic determiners in the new model of *FAS and SDE*, after being reviewed in the literature, was grouped into the following variables of the “Final Questionnaire of the Doctoral Thesis” sent to the companies related to the defence industry.

Therefore, in Table 2 we describe our classification of the questionnaire’s questions taking into account the empiric investigation’s objectives:

▪ **Hypotheses of the investigation.**

For all these considerations, to finish with, seven propositions are established with their respective working hypotheses, which respond

to the “Analysis of determining factors in the modernisation and professionalisation of the FAS and SDE”.

First Proposition (A):

The strategic determiners of the new model of FAS and SDE can be grouped into the actions of modernisation and professionalisation, under the principle of rationalisation, the complexity of the Organisation of Defence, and the factors of the contracting process. These dimensions of the new EOD significantly influence the attitude of the companies related to the defence industry.

Second Proposition (B):

In the EOD the companies related to the FAS and SDE are characterised by certain contingent and structural factors; we consider as results the measures of innovation and excellence of the companies related to the defence industry.

Furthermore, we reason diverse stipulations about the measures of business excellence, broken down into knowledge of the factors associated to technological innovation, social corporate responsibility and the management of total quality.

Third Proposition (C):

There is a significant influence in business innovation, defined through the measures of innovation, the facilitator values, the results of innovation and excellence; on inter-organisational relations, and the Company Results of the EOD.

To conclude the discussion of the focus of innovation on measures of excellence, we

Table 2 - Information gathered in the questionnaire.

OBJECT OF STUDY IN THE QUESTIONNAIRE.	QUESTION NUMBERS
General data.	Questions 1 to 5.
Innovation and objectives of the companies.	Questions 6 to 8.
New Focus for the Organisation of Defence (EOD).	Questions 9 to16.
Analysis of the processes of inter-company cooperation.	Questions 17 to 23.
Department or management team for cooperation projects.	Questions 24 to 28.
Importance of the most appropriate studies for the industry.	Question 29.

Source: Own production.



consider that the most noteworthy variables in the previous exposition could influence the three elements of company structure: 1) human elements, 2) material elements, and 3) immaterial elements. These considerations justify the fourth proposition.

Fourth Proposition (D):

A significant positive influence from the focus on innovation exists, defined through the actions on the human; material and immaterial elements; and the measures of excellence, on the Business Results of the EOD.

Fifth Proposition (E):

A significant influence from the measures of social corporate responsibility, improvements in quality, and the results of excellence, exists on the Business Results of the EOD.

Sixth Proposition (F):

A significant influence from certain contingent factors; the degree of fulfilment of business objectives; and the rest of the factors associated with the EOD, is exerted on the results of the companies related to the defence industry.

We justify the study of inter-organisational economic relations, for all the benefits that these bring to the new EOD and to the companies which have relations with the industry, allowing them to achieve individual and common objectives through these forms of business collaboration, as well as how the FAS can reach their professionalisation and modernisation objectives. In this way we can study if an association exists between the factors of the Model of FAS and SDE, and the establishment of collaboration relationships, and cooperation agreements between companies in the defence industry. With these arguments the following proposition is formulated:

Seventh Proposition (G):

A significant influence from the strategic determiners of the New Model of FAS and SDE exists, in terms of rationalisation, complexity, defence culture, results, and business performance; on the establishment of inter-organisational relations between the companies of the defence industry.

Finally, for the “Analysis of the possible cooperation of the Ministry of Defence with External Organisations”, three further propositions for the empiric investigation are developed. From the literature examined, as well as from the exploration undertaken in the academic literature, the variables of the inter-company cooperation processes are obtained, as are the different considerations in the election of strategic alliances. From these aspects the eighth theoretical proposition is derived:

Eighth Proposition (H):

There is a significant influence of certain contingent factors and the analysis of the processes of inter-company cooperation defined in terms of social structure, knowledge/experience, behaviour, inhibitors, strategic reasons, and cooperation mechanisms (contractual agreements, shareholder agreements, inter-company networks, informal agreements); on inter-organisational relations between the FAS and the companies of the defence industry.

Below we will deal with another series of questions related to cooperation, and the preparation of a proposal for the “Management of the Cooperation between the FAS and the Companies related to the Defence Industry”.

The ninth proposition studies the proposal as to the existence or not of a “*Department or Management Team for Cooperation Projects*”, within the Ministry of Defence. This can have diverse missions, commissions or services, all of which refer to tasks related to the mechanisms of cooperation, and the establishment of strategic alliances in companies of the defence industry.

Ninth Proposition (I):

There is a significant influence in the creation of a Department or Management Team for Cooperation Projects between Organisations (DEGE PDC), defined in terms of critical activities, functional support for that structure, keys to success, and cultural values of the companies of the defence sector; on the improvement in working and efficiency of the new model of FAS and SDE.

Finally, taking into account the aspects of the theoretical framework referring to: 1) the adoption of TICs with collaboration ends and



e-Business Tools; 2) the integration of *e-government* technologies into the business processes; and, 3) the benefits of the *Systems of Decision and Business Information (SDIE)*, by permitting the companies to operate in an atmosphere of collaboration and cooperation; we incorporate the final proposition into our study:

Tenth Proposition (I):

The utilisation of Collaborative TICs is positively associated to the promotion of collaboration and the management of business cooperation projects.

- Data Analysis and statistic techniques.

We incorporate the final methodological orientation to “*universalise and experiment*” the study in reference to the analysis of the cooperation processes, and the functionality of the existence of a “Department or Management Team for Cooperation Projects- DEGE PDC”. The “*universalisation and experimentation*” of the analysis of inter-company cooperation in the companies of the *Micro (2001-2004)* and *e-Micro (2005-2007)* projects of the municipality of Murcia is justified; the objectives of which are derived from these European projects of the IC. Five theoretical propositions of the analysis of the cooperation processes in the companies are also shown and justified.

The statistical techniques that we use for the evaluation of the information are as follows:

The initial analysis is taken with the description of the sample of companies, the descriptive studies of the variables related to the new model of FAS and SDE, and of the inter-company cooperation. Secondly, we carry out a classification of variables by homogeneous groups of companies, using the procedures of Hierarchical Conglomerate Analysis, and of K-means. To this end, we endeavour to know the strategic determiners for the modernisation and professionalisation of the FAS, in the following terms: 1) business factors associated to the modernisation and professionalisation of the FAS and SDE; 2) the intrinsic business factors of the focus presented in the EOD; and, 3) the factors of the inter-organisation relations, the analysis of the processes of inter-

company cooperation, and the management of the cooperation between the Ministry of Defence and external organisations. We carry out discriminatory analysis with explicative and predictive ends, taking into account that companies belonged to one group, to identify the firms according to classificatory variables, and thus to know the profile of the sets of companies according to the most representative classificatory variables from the research questionnaire. With this procedure, we obtained five discriminatory functions “D” to later classify the firms related to the extent of the study. We continue with the analysis of the principal components, which group together all the variables from the questionnaire sent to the companies of the defence industry, in order to know the factors that will be taken into consideration in the analysis of inferences of the theoretical propositions and working hypotheses. For the contrast of the seven proposals of the new EOD, and the three theoretical propositions for the development of Cooperation Processes amongst External Organisations to the Ministry of Defence, we apply models of statistical dependence of linear regression, binary and multinomial logistics.

4. RESULTS AND CONCLUSIONS

The results to the empiric investigation and conclusions considered to be the most important of the previous chapters are shown, broken down into theoretical, methodological and empiric aspects.

• Characteristics and Profile of the Companies Studied.

The majority of the companies have had activity for more than 10 years and the mean time for the relationship with defence is around 17 years. Small companies appear more frequently. Stability in the job positions appears to exist, and in certain firms there are great numbers of staff. The companies show a medium level of globalisation and internationalisation. Almost all the firms are to be found in the tertiary and secondary sectors, with a greater emphasis on the former. The proportion of multi-plant companies is slightly higher than that of single



plant companies. Half of the companies can be found in the Community of Madrid, and the others are distributed throughout Murcia, Catalonia, Andalusia and the Basque Country.

• **Innovation and Business Objectives.**

In general the companies seek business innovation. The greatest efforts are destined to improving the quality of products and services, and in specialising in segments of the market. The measure considered to be most relevant is the incorporation of personnel qualified in key technology. The majority (58%) maintain contacts with institutions and investigation centres to favour technological innovation. There is dependence between the measures of business innovation and the achievement of the objectives of the firms. Therefore, the inter-organisation relations with institutions and investigation centres to favour technological innovation facilitate the achieving of the principal business objectives.

• **New Focus for the Organisation of Defence (EOD).**

The measures that the companies consider to be most related to success in the administration and management of the firms are business recognition and the adapting and optimisation of resources. The companies dedicated to the services and maintenance contracts are the most specialised in their relationship with the FAS and SDE. The firms lend their services or serve their products in their majority upon agreements or (upon needs) to the requirements of the FAS and SDE. The companies with a technological base present a major association with specialisation. In relation to the contracting with the Ministry of Defence, the aspect considered to be most relevant by the firms is to give a professional image. The existence of a formal programme and the stability or the absence in changes in the supply programmes are the aspects most related to administrative contraction of the FAS. For that reason, we consider that the success in the planning for the Organisation of Defence must be to provide a decision-making system based on cooperation processes, coordinating them with strategic levels, and tactics of the Ministry of Defence. The activities carried out for the FAS, have derived basically in an improvement

in the productive and commercial relationship of the companies. In addition, they generate sources of competitive advantages.

In general, the firms consider that there is no difficulty in the contracting procedures with the Public Administration, although they think that the procedures are lineal and hierarchical, as well as there being certain centralisation of the information and too much systematisation. On the other hand, they believe they possess the resources and capacities necessary so as to have no difficulty in contracting. A positive restructuring exists within the companies, derived from the strategy of the new EOD, which originates an institutionalisation of the processes in favour of the Defence Industry. In reference to the measures of social corporate responsibility to value the attitude of the companies in the face of the new EOD, all qualify positively the policies derived from a business administration and management that is effective and efficient with its environment. Likewise, in relation to the measures of social corporate response, they believe they have the means and resources to be able to respond to the needs of the FAS, and, on the other hand, they affirm that they attend to the suggestions and demands for improvement by their clients. The firms think that the modernisation of the FAS and SDE may be harmed due to a lack of flexibility, the organisational complexity, lineal communication and the hierarchy of the Organisation of Defence; as well as by the scarce capacity to capture, retain and motivate the human capital.

• **Processes of Inter-Company Cooperation.**

The level of business associationism in the companies related to Defence is very high (91.10%). However, only slightly more than half the firms maintain relation with business associations of the Defence Industry. The majority (62.3%) of the companies count on previous experience in inter-company cooperation. They manifest that this has led to an improvement in the industry, to collaborate closely and to make the necessary changes in order to cooperate. Ignorance and a lack of information about cooperation appear as the principal inhibitors to cooperation processes. Of



the collectives in the domains of the companies related to defence, a greater predisposition to cooperate with suppliers, with the Ministry of Defence and with clients is observed. Similarly, in relation to the “universalisation and experimentation” of the cooperation processes, we can state that the results obtained from the two samples of the study do not differ substantially. Therefore, the suppliers, clients and/or institutions are the collectives which are considered most appropriate to cooperate with. The principal strategic reasons that motivate the firms to cooperate are: to be able to accede to resources and capacities they do not possess, the creation and exploitation of synergies and to overcome trade barriers in the markets. The cooperation mechanisms considered to be closest to the needs of companies related to defence are “long term contracts for concrete activities” and agreements with suppliers,

distributors and “Vertical Network” clients. Once again, in relation to the “universalisation and experimentation” of the cooperation processes, the results obtained in the two samples do not differ significantly.

• **Department or Management Team for Cooperation Projects.**

The majority (72.3%) of the companies considered positive the existence of the Department or Management Team for Cooperation Projects (DEGE PDC), within the Ministry of Defence. The DEGE PDC is considered useful, principally to improve business results and to prevent undesirable situations or deviations in the supply programmes to the FAS and SDE. In general the firms consider that the existence and utilisation of the DEGE PDC benefits all the factors in inter-organisation relations,

Table 3 - Contingent and structural factors

CONTROL VARIABLES	SECOND PROPOSITION (B)							
	H ^{B1}	Yes	H ^{B11}	NO	H ^{B21}	NO	H ^{B23}	NO
H; Age of the company (ANT _{1-E} _j).	H ^{B1}	Yes	H ^{B11}	NO	H ^{B21}	NO	H ^{B23}	NO
H; Length of relation with Defence (ANT _{1-D} _j).	H ^{B2}	NO	H ^{B12}	NO	H ^{B22}	NO	H ^{B32}	NO
H; Company size (TAM _j).	H ^{B3}	NO	H ^{B13}	NO	H ^{B23}	NO	H ^{B33}	NO
H; Globalisation and internationalisation (INT _j).	H ^{B4}	NO	H ^{B14}	NO	H ^{B24}	NO	H ^{B34}	NO
H; Sector of business activity (SEC _{1-A} _j).	H ^{B5}	NO	H ^{B15}	NO	H ^{B25}	NO	H ^{B35}	NO
H; Location of work centres (LOC _j).	H ^{B6}	NO	H ^{B16}	NO	H ^{B26}	NO	H ^{B36}	NO
H; Defence Specialisation (SEC _{2-D} _j).	H ^{B7}	NO	H ^{B17}	YES	H ^{B27}	YES	H ^{B37}	YES

Source: Own Production. Where: YES (accepts); Yes (partially accepts); ⁽⁻⁾ (negative/inverse)

Table 4 - Contingency and structural factors

CONTROL VARIABLES	PROPOSITIONS AND PROPOSAL (BLR)							
	SIXTH		EIGHTH		NINTH		BLR	
	F	H	I	MODEL				
H; Age of the company (ANT _{1-E} _j).	H ^{F1}	NO	H ^{H1}	Yes ⁽⁻⁾	H ^{I1}	NO	H ^{1.B1}	NO
H; Length of relation with Defence (ANT _{1-D} _j).	H ^{F2}	NO	H ^{H2}	NO	H ^{I2}	NO	H ^{1.B2}	NO
H; Company size (TAM _j).	H ^{F3}	NO	H ^{H3}	NO	H ^{I3}	NO	H ^{1.B3}	Yes ⁽⁻⁾
H; Globalisation and internationalisation (INT _j).	H ^{F4}	NO	H ^{H4}	NO	H ^{I4}	NO	H ^{1.B4}	Yes
H; Sector of business activity (SEC _{1-A} _j).	H ^{F5}	NO	H ^{H5}	NO	H ^{I5}	Yes	H ^{1.B5}	NO
H; Location of work centres (LOC _j).	H ^{F6}	NO	H ^{H6}	NO	H ^{I6}	NO	H ^{1.B6}	NO
H; Defence Specialisation (SEC _{2-D} _j).	H ^{F7}	YES	H ^{H7}	Yes	H ^{I7}	Yes	H ^{1.B7}	NO

Source: Own Production. Where: YES (accepts); Yes (partially accepts); ⁽⁻⁾ (negative/inverse)



and above all, could favour communication and dialogue between partners, in reaching agreements and trust. Likewise, in relation to the “universalisation and experimentation” of the cooperation processes, we find that on this point major differences do not exist between the results of the two samples studied. The majority (75.8%) of the companies considered the DEGE PDC to be functional in all areas of the company, in relation to the management of cooperation agreements. The strategic factor best considered to be successful in managing cooperation projects with the FAS and SDE, is the fulfilment of the obligations contracted. The actions that present a greater correlation with the “*performance*” and which allude to stability in the development of cooperation agreements with the Ministry of Defence are the incorporation in the management of the cooperation projects of procedures to resolve conflicts and to lessen difficulties by reaching prior agreements. Therefore, we consider that conflicts between partners in cooperation can be assisted and/or lessened by the functioning of the DEGE PDC, developing new negotiation and readjustment procedures, to provide more effective agreements, or to re-establish the balance between partners in terms of fairness.

The majority (88.6%) of the firms consider the use of “Collaborative TICs” to be very appropriate as a support in the management of cooperation projects. These tools ease the decision and information systems, help the management of business cooperation projects, lead to a relation of quality and continual improvement with the clients and can promote a closer relationship with the suppliers. The studies that the companies judge to be most adequate in relation to the “Defence Culture” are those which refer to the continuity of projects developed for the FAS, and those that concern the implications of cooperation in the Defence Industry.

• **Analysis of the Propositions and Theoretical Proposals.**

In the first place (Table 3), the contingency and structural factors formed by the control variables, in the inferences analysis in the

theoretical propositions of the EOD, present the following results in terms of acceptance or rejection of the hypothesis.

Table 4 presents the results of acceptance or rejection of the statistical hypotheses of the control variables, which correspond to the sixth, eighth, and ninth theoretical propositions and the proposal that has been evaluated with the binary logistic regression model.

Contrasting the seven proposals of the new EOD (Table 5), and the three theoretical propositions of the development of Cooperation Processes between External Organisations to the Ministry of Defence (Table 6), is carried this out with models of statistical dependence of linear regression (RLM), and binary logistics (RLB), with the following results being obtained:

- The attitude of the companies of the Defence Industry is influenced positively; on the one hand, by the principle of rationalisation which presides the new model of FAS and SDE, and on the other hand, by the absence of difficulties in the contracting process with Defence.
- Innovation and excellence are business results, obtained by the firms related with Defence, as a consequence of the new EOD.
- The specialisation in goods and services offered by the companies for the needs of the FAS and SDE is positively associated with the business results, with the inter-organisation relations and with the improvement in the management of the cooperation between the FAS and the companies. Moreover, this is considered to directly influence the degree of innovation, the measures of social corporate responsibility and the improvement in quality in the industry.
- Inter-organisation relations and collaboration agreements are considered as competitive tools by the companies, in order to acquire value and achieve results in innovation.
- The results derived from the new EOD influence the measures adopted by the firms in order to achieve business excellence.
- The results derived from the new EOD affect the focus of the innovation and the measures of excellence of the companies (research



Table 5 - Theoretical propositions of the new focus for the organization of defence

FIRST PROPOSITION (A)	BUSINESS ATTITUDE.	
	H ^{A1} ; Objectives of the FAS Model.	NO
	H ^{A2} ; Rationalisation of the FAS.	YES
	H ^{A3} ; Complexity of the FAS.	NO
	H ^{A4} ; Contracting Process.	YES
SECOND PROPOSITION (B)	FOCUS (EOD) AND BUSINESS RESULTS.	
	H ^{B8} ; Results of Innovation.	YES
	H ^{B9} ; Results of Excellence.	YES
THIRD PROPOSITION (C)	INTER-ORGANISATION RELATIONS.	
	H ^{C11} ; Measures of Innovation.	NO
	H ^{C12} ; Values of Innovation.	Yes
	H ^{C13} ; Results of Innovation.	YES
	FOCUS (EOD) AND BUSINESS RESULTS.	
	H ^{C21} - Perception of professionalism by the client.	YES
	H ^{C21} - Knowledge and increase in technological advances.	YES
	H ^{C21} - Recognition of employees and human capital.	YES
	H ^{C22} - Incorporation of new products and services.	YES
	H ^{C22} - Accedes to and specializes in segments of the market.	YES
	H ^{C22} - Participation in the contracting process.	YES
FOURTH PROPOSITION (D)	FOCUS (EOD) AND BUSINESS RESULTS.	
	H ^{D1} - Research and development activities (I+D+i).	YES
	H ^{D1} - Production systems developed by experts.	YES
	H ^{D1} - Programming, evaluation and the control of objectives.	YES
	H ^{D1} - Learning and continual innovation.	YES
	H ^{D2} - Agreements appropriate to the strategy.	YES
	H ^{D2} - Policies of improving the company environment.	YES
	H ^{D2} - Style of work as a team.	YES

Source: Own Production. Where: YES (accepts); Yes (partially accepts); (-) (negative/inverse).



Table 5 (continuation) - Theoretical propositions of the new focus for the organisation of defence

FIFTH PROPOSITION (E)	FOCUS (EOD) AND BUSINESS RESULTS.	
	H ^{E1} - Social Corporate Responsibility.	YES
	H ^{E2} - Improvements in Quality.	YES
	H ^{E3} - Results of Excellence.	YES
SIXTH PROPOSITION (F)	FOCUS (EOD) AND BUSINESS RESULTS.	
	H ^{F8} ; Inhibitor Factor.	NO
	H ^{F9} ; Rationalisation Factor.	YES
	H ^{F10} ; Objectives and Success Factor.	NO
H ^{F11} ; Innovation Factor.	NO	
SEVENTH PROPOSITION (G)	INTER-ORGANISATION RELATIONS.	
	H ^{G1} ; Rationalisation in the Model of FAS/SDE.	YES
	H ^{G2} ; Complexity in the Organisation of Defence	YES
	H ^{G3} ; Defence Culture.	YES
	H ^{G4} ; Business Results of Focus (EOD).	YES
	H ^{G5} ; Business <i>Performance</i> of Focus (EOD).	YES

Source: Own Production. Where: YES (accepts); Yes (partially accepts); ^(c) (negative/inverse)

and development activities; production systems developed by experts; programming; evaluation; controlling objectives; continual learning and innovation; agreements appropriate to the strategy; policies of improving the company environment and democratic participation).

- Social corporate responsibility (RSC), improvements in the quality of the industry and the results of excellence measures are considered strategic determiners of the EOD.
- Rationalisation measures intervene notably in the business results.
- Inter-organisation relations are influenced by the strategic determiners of the new EOD.
- The experience or knowledge of the mechanisms of cooperation; cooperative behaviour; and the strategic reasons for cooperation, affect inter-organisation relations between the FAS and the companies. Moreover, the older age of the company negatively affects its establishment.

- The incorporation of a “Model for the Management of Cooperation Projects” is associated with the improvement in the functioning and efficiency of the EOD. Therefore, the DEGE PDC is considered adequate in handling critical activities, to achieve success in cooperation, in strengthening the defence culture and in the utilisation of Collaborative TICs.
- A weak dependence relationship exists between the utilisation of Collaborative TICs and the promotion of cooperation with suppliers and clients. Furthermore, prior experience in cooperation; the systems of business decisions and information; the management of cooperation projects; and the presence of a greater sized company all influence in the degree to which the Collaborative TICs are utilised.



Table 6 - Theoretical propositions of inter-company cooperation with external organizations

EIGHTH PROPOSITION (H)	INTER-ORGANISATION RELATIONS.	
	H ^{H8} ; Business Associationism.	NO
	H ^{H9} ; Experience and Knowledge.	Yes
	H ^{H10} ; Cooperative Behaviour.	YES
	H ^{H11} ; Cooperation Inhibitors.	NO
	H ^{H12} ; Strategic Reasons.	YES
	H ^{H13} ; Contractual Agreements.	Yes ⁽⁻⁾
	H ^{H14} ; Shares Agreements.	Yes ⁽⁻⁾
	H ^{H15} ; Inter-company Networks.	NO
H ^{H16} ; Informal Agreements.	NO	
NINTH PROPOSITION (I)	IMPROVEMENT IN THE FUNCTIONING AND EFFICIENCY IN THE MODEL OF FAS AND SDE.	
	H ^{I8} ; Critical Activities.	YES
	H ^{I9} ; Functional Support.	NO
	H ^{I10} ; Keys to Success.	YES
	H ^{I11} ; Collaborative Information Technologies - TICs.	YES
	H ^{I12} ; Defence Culture.	YES
TENTH PROPOSITION (J)	COLLABORATIVE TICs FOR THE MANAGEMENT OF BUSINESS COOPERATION PROJECTS	
	H ^{J1} ; TICs and Cooperation with Suppliers.	YES
	H ^{J2} ; TICs and Cooperation with Clients.	YES
	H ^{J3} ; TICs and Previous Experience in Cooperation.	YES
	H ^{J4} ; TICs and the Systems of Decision and Information.	YES
	H ^{J5} ; TICs and the Management of Cooperation Projects.	YES
	H ^{J6} ; TICs and the Presence of Greater Sized Company.	YES

Source: Own Production. Where: YES (accepts); Yes (partially accepts); (-) (negative/inverse)

5. CONSIDERATIONS, LIMITATIONS AND FUTURE INVESTIGATION

The feature which best defines the companies of the Defence Industry is their specialisation in goods and services offered to the FAS and SDE; which corresponds with the needs of the EOD. Likewise, innovation and excellence, “social corporate responsibility” and “quality” are confirmed as business results derived from the EOD.

From another perspective, it is verified that the defence culture and the complexity of the Organisation of Defence are intrinsic factors that affect the objectives of the Ministry of Defence. Moreover, commitment and inter-organisation relations are considered tools that help in achieving modernisation and professionalisation, under the principle of rationalisation of the FAS and SDE.



The inclusion of a model for the management of cooperation that is based in the Department or Management Team for Business Cooperation Projects (DEGE PDC), as a new contribution to the studies referred to in the analysis of the cooperation processes, is considered appropriate for a large majority of the Defence Industry firms. The DEGE PDC could be valued as a useful tool to promote inter-organisation relations and for the monitoring of cooperation processes with the Ministry of Defence. Therefore, we believe that the functioning of the DEGE PDC for the improvement in effectiveness in the principal areas of the management of cooperation projects in the companies related to the Defence Industry is confirmed.

We are aware of the limitations that the first part of the theoretical study presents, bearing in mind the lack of documentary reference, as well as the shortage of empiric investigations, and of data for the effects of modernisation and professionalisation of the FAS and SDE on the companies. From the knowledge acquired in the Organisation of Defence, and aware of the dynamic character and the diversity of aspects that it can cover with the study of the inter-organisation relations between companies and the Ministry of Defence; we could go more deeply into the conception of the EOD, with the object of carrying out new investigations, and/or to add value to the development of the culture of the measures of business excellence, the culture of innovation, and in general the defence culture of the companies related to the FAS and SDE.

To this end, for the future we are thinking of carrying out new studies of the dimensions dealt with in the EOD and which are affected by the processes of institutional change, and other suitable circumstances of the strategic adaptation of the organisations to the setting or environment. Since the scales that measure the diverse components associated to the model of FAS and SDE have demonstrated their statistical validity in the exploratory analyses, we could simultaneously study the different constructs, and analyse by means of a factorial confirmatory analysis the strategic determiners

linked to the EOD, corresponding to the approach of a model of simultaneous structural equations.

BIBLIOGRAPHY

BRIONES, A.J. (2009) (Coordinador): *El gobierno en la industria de defensa. Aula abierta y foro de estudio de seguridad y defensa*, Universidad Politécnica de Cartagena y Ministerio de Defensa. Dirección General de Relaciones Institucionales e Instituto Español de Estudios Estratégicos, Ediciones Diego Marín, S.L., Murcia, España.

BRIONES, A.J. y LABORDA, F. (director) (2007): *Determinantes Estratégicos en el Modelo de Modernización de las Fuerzas Armadas y Sistemas de Defensa. Análisis de los Procesos de Cooperación con Organizaciones Externas*, Tesis doctoral. Doctorado con Acreditación Europea, Programa "Gestión de Empresas de la Universidad Politécnica de Cartagena (UPCT)", Premio Extraordinario 2007/2008.

BRIONES, A.J. y CEGARRA, J.G. (2007): "Perspectiva dinámica del capital relacional desde la supervisión del OJC en la MIPYME", *Cuadernos de Administración*, 20, (34), julio-diciembre, pp. 115-137.

CEGARRA, J.G.; DEWHURST, F.W. y BRIONES, A.J. (2007): "Factors affecting the use of e-government in the telecommunications industry of Spain", *Technovation*, 27, pp. 595-604.

EQUIPO EDITORIAL IDS (2003): *Programas de defensa: oportunidades para las empresas*, Informe Ejecutivo, Información de Defensa y Seguridad (IDS), Madrid.

FERNÁNDEZ, S., y FORENSA, A. (2003): *Facilidades a las compañías de defensa en parques tecnológicos*, Información de Seguridad y Defensa (IDS), Madrid.

GARCÍA-ALONSO, J.M. (1994): "Introducción a la industria de la defensa en España". En *Gasto Militar y Crecimiento Económico. Aproximación al caso español. Cuadernos de Estrategia*, Instituto Español de Estudios Estratégicos, Segunda Sección: Medios para la Defensa, CESEDEN (España), nº 64, Ministerio de Defensa.

GARCÍA-CANAL, E. (1992): *Acuerdos de Cooperación entre Empresas en España 1986-1989. Análisis desde la Economía de la Organización*, Tesis Doctoral, Servicio de Publicaciones de la Universidad de Oviedo.

LABORDA, F. (1997): *Cooperación empresarial, Análisis de la capacidad de agrupación de pymes comerciales del casco antiguo de Cartagena*, Tesis Doctoral Publicada, Confederación Comarcal de Organizaciones Empresariales de Cartagena, COEC, Cartagena.