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A financial analysis of the Spanish Defence Industry

Abstract

The analysis of the Spanish defense industry is still at an advanced stage due to the lack of adequate information and the little relevance that this topic has in the academic world. In this work an economic-financial approach is made to the Spanish defense industry in order to deepen the knowledge of some features of its structure, conduct and results. To this aim, the classic ECR approach of the Industrial Economics is used. The years 2012 and 2016 have been considered, in order to show the main changes that have taken place as a result of the exit of the economic crisis.

Keywords

Defense industry, Spain, SCP analysis, financial ratios.

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Introduction

The study of the Spanish defence industry requires knowledge that goes beyond the usual analyses that address turnover, employment, exports and, in some cases, variables linked to innovation. For this reason, this paper attempts to delve deeper into more novel aspects linked to financial variables, although without excluding the classic factors already mentioned. This allows for a deeper understanding of the industry, complementing the more classical aspects with others that have hardly been addressed.

As Fonfría (2012) explains[1] 'The study of the functioning of the Spanish defence industry lacks both theoretical and empirical analyses that have a certain depth and representativeness in this field. In some cases, studies have been carried out on specific subsectors of those usually included in this industry, but with reference either to a small number of companies, normally the largest and most representative — assuming that their activity represents the whole, with no general prior study of this — or to a broad analysis of cases, whose statistical representativeness and results are far from being extensive to the whole, or to aggregate studies which do not allow for the analysis of certain aspects in detail'.

As is well known, the trend within the European Union (EU) is towards a market in which national industries are diluted, with the long-term aim of having an integrated European industry with the large corporations driving the destinies of the remaining companies in the current national defence industries.

This situation can be positive for countries with the largest companies or extremely powerful industrial conglomerates, such as the UK, Italy or France. However, for countries with smaller industries the outcome may not be too positive. This would be the case of Spain, as the intermediate size of its defence industry puts it at a disadvantage compared to other countries, such as those mentioned above. This is why a thorough understanding of the financial capabilities of this industry is necessary.

The aim of this paper is to analyse in depth some economic-financial aspects of the companies that make up the Spanish defence industry at two points in time: in the midst of the economic crisis, 2012, and after it, 2016. It is therefore a microeconomic and sectoral study. Better knowledge of these aspects — which have hardly been analysed so far — will allow us to identify some of the industry's strengths and weaknesses and provide certain knowledge that could improve its position within Europe as a whole. It can also serve to guide defence industrial policy.

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1 Fonfría, A. (2012). Estructura, conducta y resultados de la industria de defensa española [Structure, conduct and performance of the Spanish defence industry]. *Cuadernos Aragoneses de Economía*, 2.ª época, no. 1-2, pp. 11-30.

No financial studies on the Spanish defence industry have been found that include the fundamental variables (revenues, costs, profits, etc.) at company level, beyond some partial analyses of specific companies[2].

The research question to be answered in this article is whether the end of the economic crisis has allowed defence industry companies to improve their performance and, if so, what factors have driven this improvement.

To this end, the following research hypothesis is put forward: the evolution of profits of sector companies depends substantially on costs — linked to market behaviour — and, to a lesser extent, on aspects related to market structure, since the existence of market power — oligopolies and monopolies — reduces the role of aspects related to structure.

Theoretical approach: Structure-Conduct-Performance Paradigm

The Structure-Conduct-Performance Paradigm (SCP)[3] is the traditional approach of Industrial Economics and assumes that there is a causal relationship between the structure of an industry, the conduct of firms and their performance in that market. While this has been the case in the early days[4], from the 1980s onwards it was observed that the relationships did not always go in that direction alone, but that performance affected conduct, and conduct affected structure.

It is based on the existence of basic, generally given, conditions in the industry concerned, such as level of trade union membership, regulation, etc., which affect the market structure that may arise and this in turn affects the behaviour or conduct of firms, leading to performance.

In addition to being highly useful for industrial analysis, the value of this approach is also that it allows industrial policies to be created with a better understanding of what is happening in the sector being analysed. In short, there is feedback between the various aspects that make up the SCP paradigm as a whole, so that changes in business performance or conduct can change the structure of the market and require changes in policy.

2 See García Alonso (2010).

3 An explanation of this theoretical approach can be found in Clarke (1993).

4 In the 1950s, Mason and Bain developed this approach based on case studies. For a description of the method, see Bain (1956).

It can be summarised as follows, including details of some variables, as an example:

Basic conditions of the industry
■ Structure
■ Number of companies
■ Relative size of companies
■ Degree of product differentiation
■ Conditions of entry
■ …
■ Conduct
■ Price competition
■ Advertising
■ R&D expenditure
■ …
■ Performance
■ Degree of efficiency
■ Sharing surplus (consumers + producers)
■ New product introduction rate
■ Profit
■ …
Public policies

Source: Prepared internally based on Clarke (1993)[5]

Some more recent work on this approach shows that relating companies' profits to the level of concentration in the market is sufficient, i.e. a variable that approximates market power. This would suggest that restrictions to competition in a market — particularly in the defence market — would be the result of structural variables and that behavioural variables would remain in the background, Segura (2006)[6].

The analysis will take into account both market structure and company conduct and performance variables. It is important to consider them because of significant competition problems in the defence sector, which is dominated by oligopolies and even monopolies. However, with small and medium-sized enterprises (SMEs) becoming increasingly important, the structure itself may be changing in certain sub-sectors within the defence industrial field. Logically, in the face of changes in industrial structure, companies have to change their market conduct and these aspects mus also be considered.

Following García Alonso (2010)[7] the lines of defence industrial policy have changed the industrial fabric towards a significant growth in sector turnover, also boosting concentration, at least until the mid-2000s.

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5 Clark, R. (1993). *Economía Industrial [Industrial Economics].* Madrid, Ed. Celeste.

6 Segura, J. (2006). Política de defensa de la competencia: objetivos, fundamentos y marco institucional [Competition defence policy: objectives, foundations and institutional framework]. *Ekonomiaz*, no. 61, primer cuatrimestre, pp. 16-39.

7 García Alonso, J.M. (2010). *La base industrial de la defensa en España [The Industrial Base of Defence in Spain].* Madrid, Ministry of Defence

In short, the connection between the various aspects of the SCP Paradigm, including industrial policies — although the latter are not the subject of this paper — means that microeconomic aspects of Spanish defence industry companies have to be considered.

Defining the scope of analysis

Several approaches were initially used to conduct the research work carried out as it is difficult to obtain an adequate volume and disaggregation of information — or research work on the subject — in the field of the defence industry. However, several articles analyse the industry; specifically, part of this paper is based on Fonfría (2012)[8] and Fonfría and Martí (2020)[9], which study the Structure, Conduct and Performance of the Spanish defence industry.

In order to provide new knowledge on the subject covered by the aforementioned works, financial indicators were analysed, something that had not been done so far. Most studies on the defence industry use sectoral and economic data, without delving into the internal structure of companies, their financing capacity, or their costs and profits. This is a new feature of this study.

The fundamental difficulty lies in obtaining homogeneous and comparable data for the companies included in the analysis. Therefore, a scope of analysis was defined, which led to the selection of a number of companies and then focused on the SCP analysis mentioned above.

Both in the choice of companies and the sectors to be studied, the annual report on the industry produced by the Directorate General for Armaments and Material (DGAM) for 2015 was taken as a reference, completing information with reports from other years, as at the time research work began it was the last year published. Finally, information was extracted from the Orbis database[10]. Given that this database offers the possibility of obtaining a large number of economic-financial indicators, the SCP scheme was used to go beyond the economic aspects of the market, leaving the scheme with the operational variables as follows:

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8 Fonfría, A. (2012). Estructura, conducta y resultados de la industria de defensa española [Structure, conduct and performance of the Spanish defence industry]. *Cuadernos Aragoneses de Economía*, 2.ª época, no. 1-2, p. 11-30.

9 Fonfría, A. and Martí, C. (2020). Spanish Defence Industry: A long way to go. In, Hartley, K and Belin, J. (eds.). *The Economics of the Global Defence Industry*. London and New York, Routledge.

10 Having obtained all data for each of the companies, a database was created with the help of Visual Basic. It was then imported into the analysis software: SPSS. From this we obtained all the results shown throughout the article, which in some respects have been complemented by sectoral information in the absence of business data.

Basic conditions of the industry
■ Structure
■ Operating Revenue (Turnover)
■ Fixed Assets
■ Total Assets
■ Number of Employees
■ Fixed Assets/Total Assets
■ Conduct
■ Shareholder Equity
■ Shareholder Equity/Total Liabilities
■ Solvency Ratio
■ Material Cost
■ Employee Cost
■ Total Costs
■ Material Cost/Total Cost
■ Employee Cost/Total Cost
■ Performance
■ Earnings before Tax
■ Profit per Employee
■ Profit Margin
■ EBITDA[11]

Source: prepared internally

Company civilian and military activity could not be fully differentiates, so this is considered a limitation of the analysis. However, due to the increasing duality (civil-military) of a multitude of technologies, products and services, this constraint tends to be reduced over time.

With regard to the companies included, we have selected the companies provided by the DGAM, TEDAE and AESMIDE[12] as well as others — mainly SMEs —, which are known to have a turnover in the field of Defence.

Structure Analysis

Analysing the market structure of an industry for which there is no agreed definition is not an easy task, as we encounter difficulties such as: difficult access to informa-

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11 EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortisation): realised income minus expenses. Financial expenses (company taxes, interest, depreciation and amortisation) are excluded. For a broader definition see Annex.

12 TEDAE and AESMIDE are employers' associations. The first is strictly defence and the second is an association of firms working for public authorities. In the latter case, only those that also invoice for defence goods and services have been selected.

tion — this information is not available in all cases, nor are official statistics available — and duality in data, as some companies have diversified their businesses and work for both civilian and military sectors.

In this case, and given that we have opted for a more novel accounting-financial analysis, we will now explain some financial variables, which are an approximation to the structure of the sector[13].

The tables below[14] show some statistical data calculated to study the variables to be explained[15].

TABLE 1. STRUCTURE VARIABLE DATA YEAR 2012

Structure Year 2012				
	N	**Mean**	**Standard Deviation**	**CV**
Operating Revenue (Turnover)	85	22,824,599.53	50,529,741.36	2.21
Total Assets	85	55,398,538.18	213,781,701.05	3.86
Fixed Assets	85	13,334,091.84	46,378,431.25	3.48
Number of Employees	82	1,608.90	5,111.74	3.18
Fixed Assets/Total Assets	87	54,125,008.57	211,446,199.98	3.91

Source: Prepared internally with Orbis.

TABLE 2. STRUCTURE VARIABLE DATA YEAR 2016

Structure Year 2016				
	N	**Mean**	**Standard Deviation**	**CV**
Operating Revenue (Turnover)	83	25,831,898.75	64,734,621.59	2.51
Total Assets	83	52,938,101.80	198,877,921.39	3.76
Fixed Assets	83	10,957,521.64	32,079,376.09	2.93
Number of Employees	81	1,882.62	5,806.87	3.08
Fixed Assets/Total Assets	86	51,091,423.83	195,580,978.07	3.83

Source: prepared internally with Orbis
Note: the number of companies differs between the two years due to three factors: acquisition and sale processes between companies, the entry and exit of some from the military market, and availability of information in each of the years studied.

13 See Annex for the definition of the variables used.

14 Figures in Millions of $ for all tables of indicators studied.

15 The standard deviation is greater than the mean due to the existence of extreme values. Given the coexistence of companies of very different sizes and economic-financial characteristics in the defence industry and the fact that a large majority are SMEs, while a small number are large corporation, the effect obtained is a high dispersion.

N: Number of companies. CV= Coefficient of variation: defined as the quotient between the standard deviation and the mean.

<div align="center">TABLE 3. VARIATION RATES (STRUCTURE) PERIOD 2012-2016</div>

Variation Rates (Structure) Period 2012-2016				
	N	Mean**	Standard Deviation**	CV
Operating Revenue (Turnover)	86	3.14	6.39	3.15
Total Assets	81	-1.13	-1.79	-0.67
Fixed Assets	78	-4.79	-8.80	-4.22
Number of Employees	78	4.01	3.24	-0.74
Fixed Assets/Total Assets	78	-1.43	-1.93	-0.51

Source: prepared internally with Orbis. ** In %

The first of the variables that can be easily identified, and which fits the definition, is that of company operating revenues or, as it is also known, turnover. Understanding its conduct can shed light on how the structure of the industry may have evolved. As expected, turnover in the years studied (2012 and 2016) has grown at an average cumulative rate of 3.14%, which leads us to believe that performance has been reversed after the crisis, causing improvement which indicates that the industry has begun to grow positively. I argue that data on the number of employees shows this to be the case. Between 2012 and 2016, volume of employment has increased by 4.01%, parallel to the increase in sales. In other words, greater company revenues have led to more people being hired. Looking at Spanish GDP data[16] in the same years show a growth of 1.85%, which helps to create a similar evolution of these two economic indicators.

All these reasons might lead us to believe that defence spending could have followed the same growth path, but below we will see that this has not been the case. Data published by the World Bank show that spending has remained practically stable (in the period 2013-2015), but comparing 2012 and 2016 highlights a clear downward trend. The years of crisis have led to a substantial reduction in such spending. As shown in figure 1:
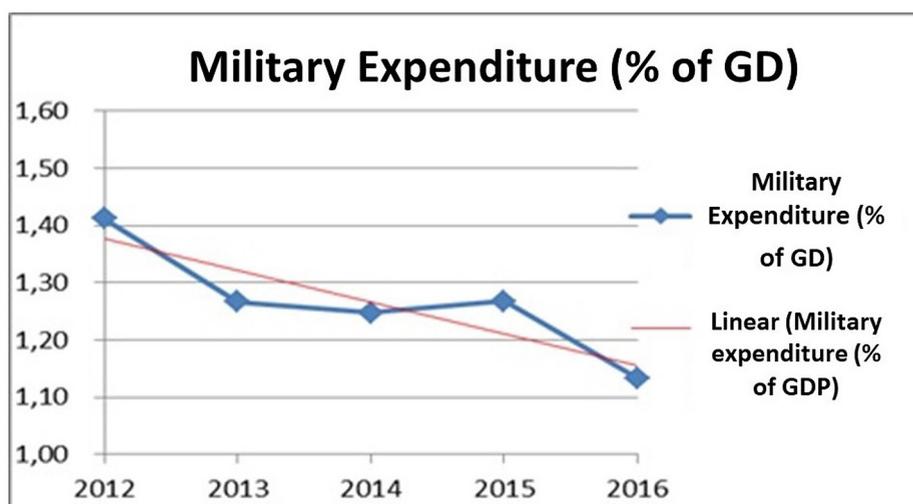
Graph 1. Military expenditure (% of GDP). Source: World Bank based on SIPRI data

16 Nominal GDP of Spain for 2012: 1,039,052 Million Euros. Nominal GDP of Spain for 2016: 1,118,522 Million Euros. Data from the Bank of Spain.

Chaining a declining trend in economic indicators we find the following two variables to consider: fixed assets and total assets. Both reflect a company's ability to meet its obligations. In other words, if a company has a high volume of total assets, in a situation of financial problems — in which it has to face unexpected obligations — it can be expected to reduce its volume of assets and thus stay in business without being too badly affected. Assets are broken down into current assets (also known as liquid assets), those that would explain the most immediate needs and therefore cover the short term, and on the other hand, fixed assets (or non-current assets) which provide information on long-term behaviour, as the company maintains these assets for more than one accounting period.

Going back to the tables above (1, 2 and 3) and analysing what has happened for these last two variables, we can see that companies have suffered a slight fall linked to decapitalisation. The crisis has therefore implied a change in their business strategies that has led them to dispose of part of their assets in order to be able to face debts and/or unexpected cost overruns.

Finally, we must analyse the ratio between the two previous indicators. This ratio would show the percentage of fixed assets to total assets. In other words, the long-term strength of companies to meet their obligations. It has clearly decreased, as was to be expected, as the crisis may have been the trigger for reducing company assets in order to be able to continue generating business volume and not have to take other types of decisions that could lead to closure.

Financial Variables Explaining Business Conduct

As in the previous section, this section analyses the variables that explain business conduct in the defence industry using financial data from companies. Three indicators will be listed along with some of their ratios in order to enrich and help draw conclusions on the path followed in the period under study.

TABLE 4. CONDUCT VARIABLE DATA YEAR 2012.

Conduct Year 2012				
	N	Mean	Standard deviation	CV
Shareholder Equity	85	12,333,608.14	38,788,050.92	3.14
Shareholders Funds / Total Liabilities	87	32.96	22.98	0.70
Solvency Ratio	85	2.48	3.84	1.55
Material Cost	81	13,555,125.96	34,743,865.55	2.56
Employee Cost	83	4,951,161.91	10,183,237.67	2.06
Total Costs	87	17,343,811.97	42,542,989.85	2.45
Material Cost/Total Cost	79	58.75	24.90	0.42
Employee Cost/Total Cost	79	41.25	24.90	0.60

Source: prepared internally with Orbis

Linked to the previous point, it is inevitable to consider the role of the new Industry 4.0 concept[17] which is being implemented and in the short term seems to have significant consequences; this is demonstrated in cost data. Some statistics are given in the tables below to help understand this.

TABLE 5. CONDUCT VARIABLE DATA YEAR 2016

Conduct Year 2016				
	N	Mean	Standard deviation	CV
Shareholder Equity	83	12,710,204.13	33,808,903.56	2.66
Shareholders Funds / Total Liabilities	86	34.69	28.17	0.81
Solvency Ratio	83	2.43	3.54	1.46
Material Cost	81	15,489,066.97	44,652,455.78	2.88
Employee Cost	81	4,604,838.81	9,607,036.04	2.09
Total Costs	86	18,925,655.45	50,652,671.07	2.68
Material Cost/Total Cost	79	60.25	23.97	0.40
Employee Cost/Total Cost	79	39.75	23.97	0.60

Source: prepared internally with Orbis

TABLE 6. VARIATION RATES (CONDUCT) PERIOD 2012-2016

Variation Rates (Conduct) Period 2012-2016				
	N	Mean**	Standard deviation**	CV
Shareholder Equity	75	0.75	-3.38	-4.10
Shareholders Funds / Total Liabilities	75	1.29	5.22	3.88
Solvency Ratio	81	-0.52	-1.98	-1.48
Material Cost	77	3.39	6.47	2.98
Employee Cost	78	-1.80	-1.45	0.36
Total Costs	81	2.21	4.46	2.20
Material Cost/Total Cost	73	0.63	-0.95	-1.58
Employee Cost/Total Cost	73	-0.92	-0.95	-0.03

Source: prepared internally with Orbis. ** In %

Company costs are of vital importance and explain a large part of the company's performance. On average, material costs have increased while employee costs have decreased. With regard to the former, this could be viewed as normal as we have gone from a year immersed in the crisis to 2016 (after the crisis) so that requirements for

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17 See Del Val Román, J.L. (2016, March). Industria 4.0: la transformación digital de la industria [Industry 4.0: the digital transformation of industry]. In *Proceedings of the Conferencia de Directores y Decanos de Ingeniería Informática, Informes CODDII.* Valencia, Spain. P. 10; and Deloitte (2017). Forces of Change: Industry 4.0. *Deloitte Insights.* Madrid. Both papers highlight the processes of industrial digitisation and how they affect cost reduction in design, operations, maintenance, etc., as well as the greater integration entailed in terms of both physical assets and human capital. A clear example is the preventive design and maintenance used in the S-80 submarine being built by Navantia.

materials are reduced as production is reduced. Employee costs can be interpreted in two ways, i.e. either the number of employees has decreased — not possible in this case, as we previously mentioned that it the number at an average rate of about 4% — or the salaries of workers have been lower.
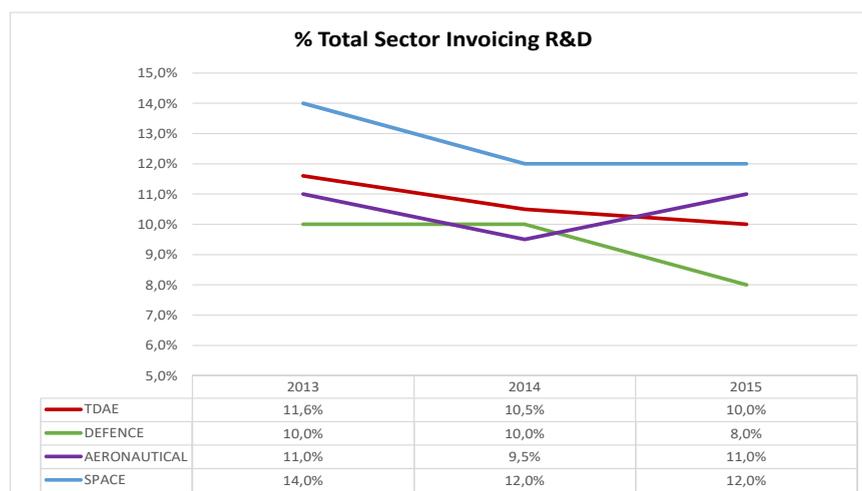
In order to reinforce the above arguments, the ratios of these indicators to total costs show — in Table 6 — that they have increased by an average of 2.21%, i.e. the material costs have increased, but not employee costs. The latter suggests that companies are less intensive in their use of human capital, and that the importance and weight of raw materials in the cost structure of companies dedicated to the Spanish defence industry has increased[18].

How are the cost-related ratios expected to behave?

Both the ratio of material cost to total costs and the ratio of labour cost to total costs illustrate how important they are for companies. On average for both 2012 and 2016, material costs represent more than half of the total, with a slight increase of 0.63%. However, the proportion of disbursements to employees is barely 40% of total disbursements, which also confirms the decline in salaries during the crisis.

If we look at shareholder equity, we can deduce that shareholders, although not to a large extent, are confident that the economy will improve and entrepreneurs will do well, as their average contributions increased by 0.75%. We must not overlook that the ratio of equity to total liabilities grew by an average of 1.29%. In other words, since we already know that equity has remained practically stable, it follows that the quotient divisor has fallen and caused company liabilities to decrease.

One of the most outstanding aspects of the defence industry is the importance of R&D&I in its activity due to the need to generate new technologies. Although the

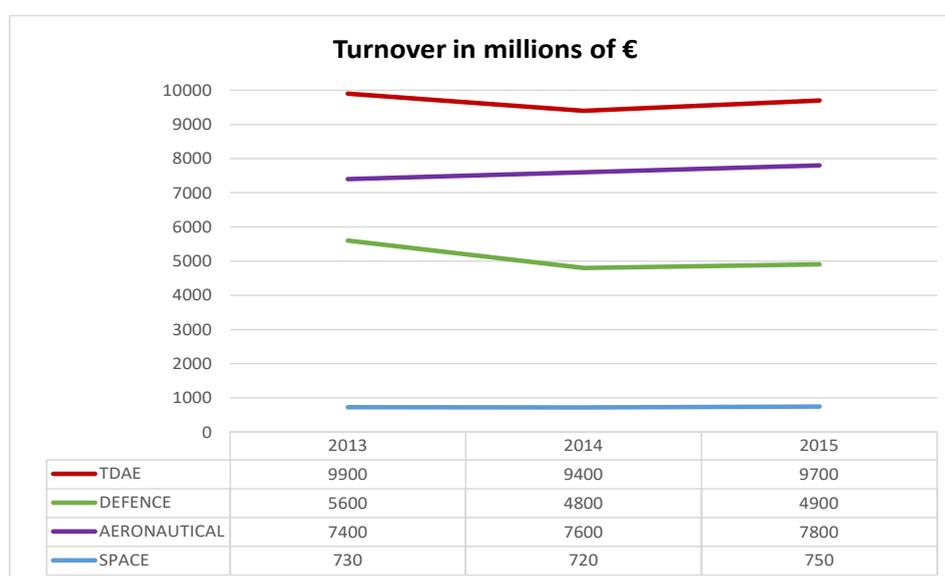| % Total Sector Invoicing R&D			
	2013	2014	2015
TDAE	11,6%	10,5%	10,0%
DEFENCE	10,0%	10,0%	8,0%
AERONAUTICAL	11,0%	9,5%	11,0%
SPACE	14,0%	12,0%	12,0%

Graph 2. R&D&I Investment of Total Turnover in each Sector. Source: prepared internally with TEDAE data

18 A good example of this could be carbon fibre in aircraft manufacturing. Very expensive material that fewer employees can handle and a possible increase in machinery that automates production processes.

Orbis database does not provide information on this subject, an approximation has been made with information from TEDAE that gives an approximate idea of R&D&I investments for the sectors for which information is provided in this source.

As the lines in the graph above show, the trend in R&D&I investment as a percentage of turnover is slightly downward, except in the aeronautics sector, which fluctuates in both directions, with a year-on-year growth between 2014-2015 of almost 16% — a value similar to the fall in the period from 2013 to 2014—. It remains practically constant in the year-on-year intervals in some of the sectors shown, as is the case in defence for 2013 and 2014, a sector in which 10% of turnover is earmarked for R&D&I. The situation is similar in the space sector, both for 2014 and 2015, where investment in R&D&I remains at 12% of turnover. As this is a turnover-dependent variable, figure 2 shows what happened for each of the sectors as above.

Turnover in millions of €

	2013	2014	2015
TDAE	9900	9400	9700
DEFENCE	5600	4800	4900
AERONAUTICAL	7400	7600	7800
SPACE	730	720	750

Graph 3. Total Turnover in Millions of €. Source: prepared internally with TEDAE data

The figures do not show very different situations between the commitment to R&D&I and the volume of turnover in the Spanish defence industry according to TEDAE data for the period between 2013 and 2015 in the different sectors. In other words, both in the space and aeronautics sectors, the growth path is practically constant, with a greater increase in the latter, as can be seen in the graph. The largest change is in defence with a cumulative average rate of change of -6.45%, reflecting the particularly negative impact it has endured.

This result is certainly logical, as investments with a high technology content are long-term and cannot be substantially modified due to the high costs the company may incur.

Finally, the importance of foreign trade in the sector must be considered. In general, exports account for a high proportion, representing 80% of total defence turnover[19].

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19 DGAM (2017).

Exports represent very high percentages with an upward trend despite fluctuations in turnover. This is a consequence of the crisis as companies have shifted their focus to international clients due to the budget reduction in Spain and, additionally and positively, leads to a greater diversification of risks.
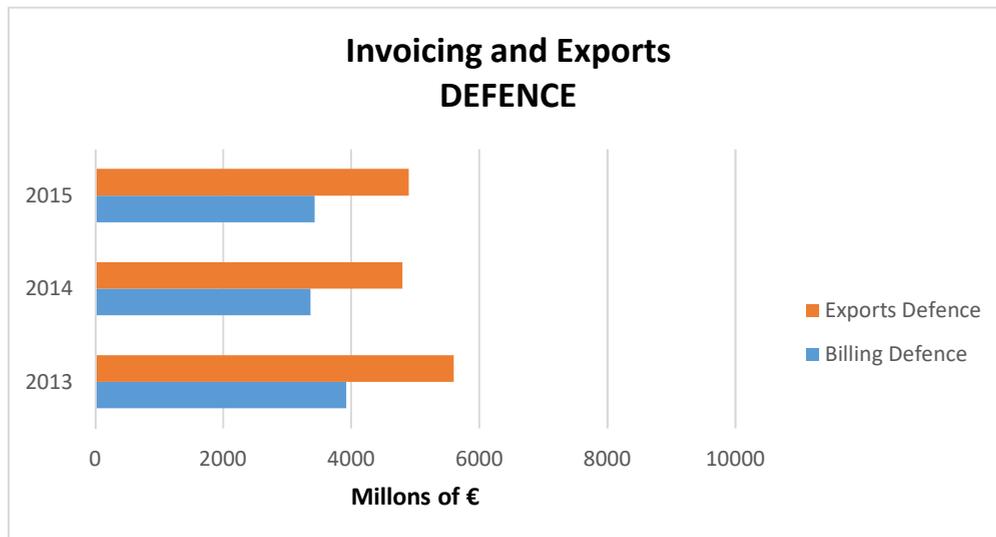
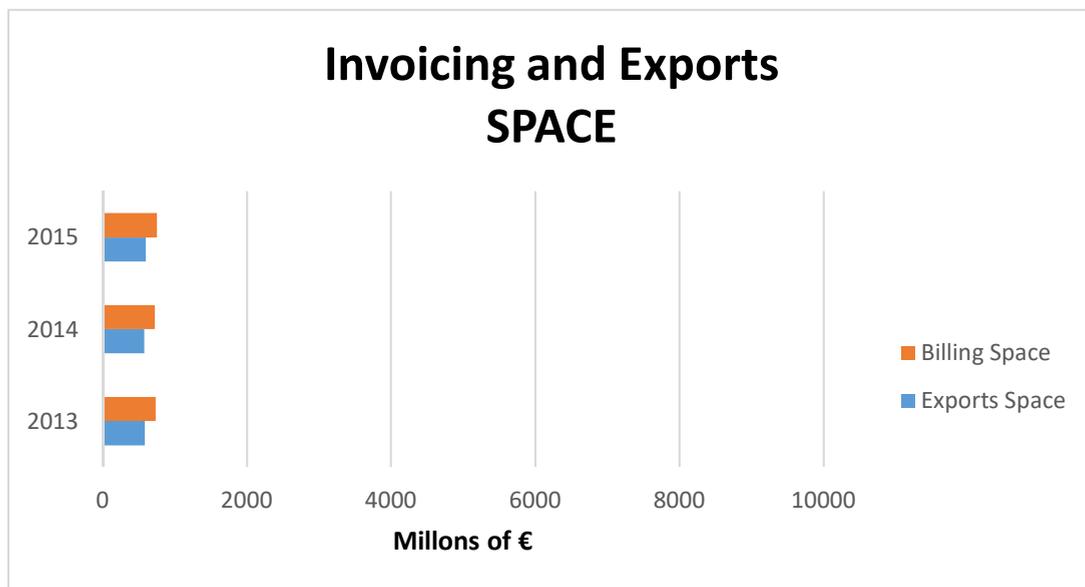Graph 4. Defence Turnover and Exports Source: prepared internally with TEDAE data

The aeronautics sector shows no negative variation rates in either turnover or export volume. In short, although there has been no spectacular growth, year-on-year growth rates of 2.7% have been generated with an average cumulative growth of 1.3%, showing a high degree of stability.
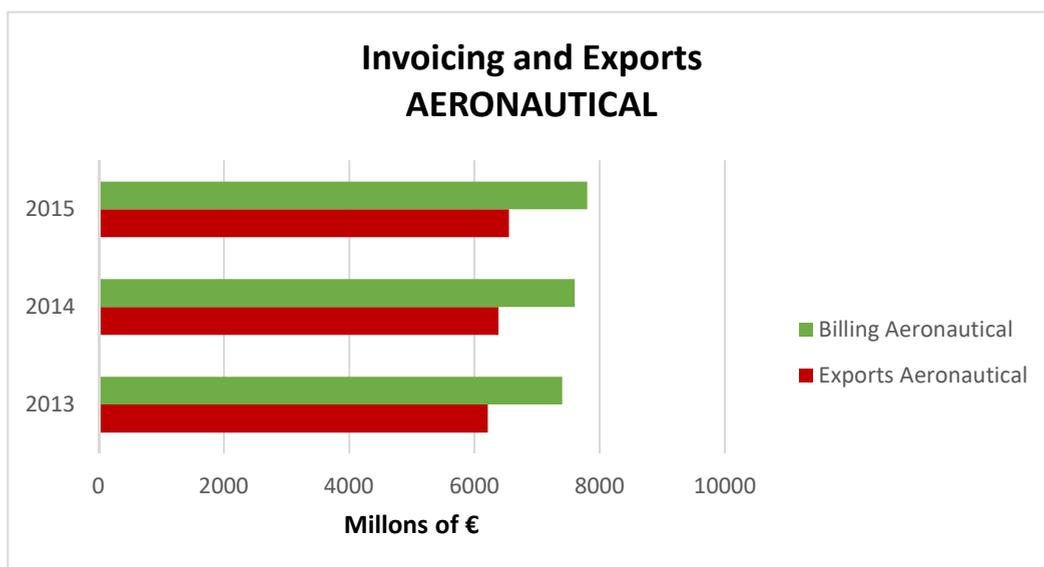
Graph 5. Aeronautic Sector Turnover and Exports. Source: prepared internally with TEDAE data

Finally, and with much lower figures than the previous sectors, the same is true in the space sector as in aeronautics, with exports showing equivalent variation rates.

This sector is in full development as several projects are expected to increase turnover, such as the Galileo project[20] (European equivalent of the American GPS) or the Earth observation project[21].

Graph 6. Space Sector Turnover and Exports. Source: prepared internally with TEDAE data

Company performance

To close the SCP scheme of the methodology, some indicators will be used to analyse company performance. The first indicator, basic for analysing this last point, is earnings before tax. This figure provides information on the trend in an accounting year net of tax payments. In other words, it is the sum of both operating results (based on the company's main activity) and financial results.

Tables 8, 9 and 10 below show the evolution of this variable for the industry as a whole, both for the indicator explained above and for the following indicators detailed below.

20 Galileo is a Global Navigation Satellite System (GNSS) developed by the European Union that provides navigation services: positioning and timing. The Galileo programme is of strategic importance for technical European Union independence because, until now, any user needing positioning data had to rely on services such as GPS or GLONASS, which are controlled by third countries. It is also of strategic importance from an economic perspective as the market for equipment and services that Galileo can provide is estimated to exceed €10 billion per year and will create many highly skilled jobs. https://www.inta.es/CPA/es/prs/

21 A clear example is the company Thales Alenia Space in Spain, which has participated in more than 120 Earth observation satellites, the European Copernicus programme, and for the Meteosat Third Generation (MTG) and GEO-KOMPSAT-2 meteorological satellites in South Korea, among others.

TABLE 8. PERFORMANCE VARIABLE DATA YEAR 2012

Performance Year 2012				
	N	**Mean**	**Standard deviation**	**CV**
Earnings before Tax	85	450,376.45	4,630,703.09	10.28
Profit per Employee	81	27.12	78.91	2.91
Profit Margin (%)	84	3.75	11.28	3.00
EBITDA	85	1,594,752.62	7,107,243.09	4.46

Source: prepared internally with Orbis

TABLE 9. PERFORMANCE VARIABLE DATA YEAR 2016

Performance Year 2016				
	N	**Mean**	**Standard deviation**	**CV**
Earnings before Tax	83	1,099,100.30	6,340,980.05	5.77
Profit per Employee	80	26.03	68.36	2.63
Profit Margin (%)	83	3.40	15.06	4.43
EBITDA	83	2,202,839.69	6,671,113.18	3.03

Source: prepared internally with Orbis

TABLE 10. VARIATION RATES (PERFORMANCE) PERIOD 2012-2016

Variation Rates (Performance) Period 2012-2016				
	N	**Mean****	**Standard deviation****	**CV**
Earnings before Tax	59	24.99	8.18	-13.45
Profit per Employee	55	-1.02	-3.52	-2.53
Profit Margin (%)	59	-2.44	7.50	10.19
EBITDA	62	8.41	-1.57	-9.21

Source: prepared internally with Orbis. ** In %

It is important to see how, on average, pre-tax earnings have grown dramatically by almost 25% during the period under review. This percentage is extremely high given that they barely exceeded 10% in many cases when studying the previous variables However, although growth is significant, it is similar to that of Spanish non-financial companies as a whole, as noted by the Bank of Spain[22].

On one hand, the Spanish economic outlook in 2012 was not in the best of conditions, which meant that companies dedicated to defence products were particularly

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22 Mendéz and Mulino (2017).

affected, hence the result obtained. Once the economy recovered in 2016, and due to significant export capacity of companies, their growing dual nature and the increased renewal of weapon systems that were becoming obsolete — mainly maintenance — the defence industry started to improve its performance.

Comparing data indicated with the variation rate shows that in 2016 there is greater stability on average with respect to 2012. In other words, the performance of pre-tax earnings during the crisis was twice as dispersed from the average as in 2012, indicating generalised positive performance in 2016 for all companies.

Profit margin is the ratio between sales and earnings before tax, according to the definition of the database from which data have been obtained. The evolution of this ratio shows significant growth of profit compared to sales, resulting in a negative quotient growth rate between 2012 and 2016 of 2.44%.

Profit per employee is expected to have decreased, as discussed above with regard to the related indicators. In fact, its cumulative annual growth rate is -1.02%, indicating that, on average, the increase in the number of employees is higher than the increase in profits, so that the growth rate of earnings has not risen sufficiently for it to generate higher profits per employee hired. This infers that wages do not increase due to higher costs per person employed.

Finally, the last financial variable included is EBITDA. The growth shown by this variable is over 8%, which is in line with the evolution of all the performance indicators seen above, together with a sharp reduction in variability by more than one third.

A preliminary analysis of SCP relationships

Having studied aspects of structure, conduct and performance separately and having extracted some of the most important characteristics of each, all three will analysed together.

As discussed above, and as Segura (2006) has argued, relating firms' profits to the level of concentration, which reflects market power, would be enough to have a sufficient picture of the underlying relationships. In other words, a market structure variable with a performance variable.

Some papers analyse this issue using the so-called 'cost pass-through' hypothesis. In other words, since defence companies have market power due to oligopolies, they can pass on their cost increases to the price they charge the customer, i.e. the Ministry of Defence, without reducing their profit[23].

23 Rogerson (1992).

This has been verified by Fonfría and Correa-Burrows (2010)[24] when explaining the profit of Spanish defence firms based on variables associated with market power and conduct in relation to contracting variables.

In the case in question, a model has been proposed in which EBITDA, expressing company performance, depends on both structural variables (concentration and size of companies according to their sales) and behavioural variables (the importance of costs, the role of financing through shareholder equity and the solvency ratio of companies). The reason for including conduct variables is twofold. On the one hand, they are expected to provide a greater explanation of business performance and, on the other hand, given that there are no studies on the financial aspects of defence companies, we wanted to analyse the weight they may have in explaining the dependent variable.

Three models have been estimated in order to take into account the different aspects of the SCP approach. Cost variables are included in all three, as they are considered to be the key factor in defining profits. Model 1 includes sales revenue as it is the second profit-defining variable.

$$EBITDA = \beta_0 + \beta_1 \: Ingresos + \beta_2 \: Costes \: Laborales + \beta_3 \: Costes \: Materiales$$

The second model includes the concentration perspective mentioned above, but sales had to be excluded because of the high correlation.

$$EBITDA = \beta_0 + \beta_1 \: Costes \: Laborales + \beta_2 \: Costes \: Materiales + \beta_3 \: Concentración$$

The final model also includes performance variables.

$$EBITDA = \beta_0 + \beta_1 \: Costes \: Laborales + \beta_2 \: Costes \: Materiales + \beta_3 \: Concentración \\ + \beta_4 \: C. \: Fondos \: de \: los \: Accionistas + \beta_5 \: Ratio \: Solvencia$$

In short, once estimates have been made in the three models, costs are significant and, as expected, negative. Both revenue and concentration are also significant in the models in which they are included, supporting the idea that market power is extremely important in defining profits in the defence industry; the higher it is, the greater the likelihood of high profits. However, none of the behavioural variables are significant. This result is in line with Segura (2006) since the role of concentration as market power is so important that it overshadows behavioural variables.

24 Fonfría, A. and Correa-Burrows, P. (2010). Effects of military spending on the profitability of the Spanish defence contractors. *Defence and Peace Economics*. Vol. 21, No. 2, pp. 177-192.

TABLE 4. ESTIMATED MODELS. DEPENDENT

Variables	Model 1	Model 2	Model 3
Constant	0.011 (0.058)	0.023 (1.093)	-0.344 (-0.946)
Revenue	5.775 (19.989)	s.e.	
Labour Costs	-1.182 (-10.904)	-0.746 (-3.999)	-1.158 (-10.333)
Material Costs	-4.801 (-19.720)	-3.427 (-8.180)	-4.728 (-18.432)
Concentration		3.676 (7.395)	5.680 (18.627)
Shareholder Equity/ Liabilities			0.054 (1.114)
Solvency Ratio			0.011 (0.230)
R2 Corrected	0.84	0.54	0.83
DW	2.021	2.048	2.138
F	137.310	29.820	66.432
No. Comments	79	79	78

Variable: EBITDA. Source: prepared internally
Note: s.e.: not included in estimate due to collinearity.

Main conclusions

After the analysis conducted in this research paper based on the SCP methodology, we can conclude that the end of the economic crisis has allowed defence industry companies to improve their performance substantially compared to other sectors[25] of the economy.

So much so that we have demonstrated that both turnover and the number of employees have increased, and this has hardly affected company solvency as they had sufficient strength in their assets to be able to face situations that arose due to the crisis in which the economy was submerged. This situation has been positively assessed by shareholders, making it possible for equity to remain stable.

Although defence spending has suffered declines, exports have been vitally important, leading to business diversification and a reorientation towards a more globalised market.

In accordance with the hypothesis on which the paper was based, the models presented and evaluated confirm that company performance does indeed largely depend

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25 The sectors considered are those included the manufacturing industry according to the CNAE (National Classification of Economic Activities).

on costs and market structure, since the latter is conditioned by the existence of oligopolies and also (in some cases) monopolies. However, entrepreneurial conduct is not a basic explanatory factor.

We must not forget that the paper has some limitations, such as being unable to fully discern between military and civilian activity, as synergies in companies focused on military business are increasingly being exploited in the civilian sphere and vice versa. Also, and most difficult to analyse, is data availability, as in some of the cases data have been obtained from reports without of company-level figures that would make a better study possible.

As a result, and as a possible future line of research, a study could be carried out based on the comparative analysis of financial variables between Spanish and European industry. For the latter, analysing the most important companies at European level.

The major value-added contribution of this study may be the use of accounting-financial indicators, which have not been applied systematically to date, although much remains to be done.

Finally, two aspects related to defence industrial policy can be derived. The first is that differences between the various sub-sectors that make up the Spanish defence industry must be analysed, as market structures are also different. Secondly, since company profits depend on market structure, the changes taking place in the EU, with increased business collaboration and funding of innovative projects, will change the structure of the Spanish defence market in a few years, which will clearly affect company profits.

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ANNEX

Fixed assets See non-current assets. (Enguídanos, 2009, pág. 15).

Non-Current Assets. Economic resources intended to serve company activities on a lasting basis, including financial investments that are expected to mature, be disposed of or realised within more than one year. (Enguídanos, 2009, pág. 18)

Fixed Assets. By definition, a fixed asset is a company resource or asset that cannot be easily liquidated (i.e. converted into cash). These may be tangible or intangible resources. Examples of tangible fixed assets: company property, equipment, furniture. Examples of intangible fixed assets: patents, copyrights, logos and other company trademarks, as well as shares. (Economía, 2016)

Total Assets. Final amount of all gross investments, cash and cash equivalents, accounts receivable and other Assets as presented in the balance sheet. (http://www.investorguide.com/, s.f.).

Fixed Assets/Total Assets. Ratio of fixed assets to total assets.

Profit per Employee. Quotient of a company's net profits to the total number of its employees.

Material Cost. Costs arising from the materials necessary for a company's core business.

Employee Costs. Cost per person hired in the company.

Total Costs. Sum of the costs of all factors consumed or applied to the cost object. Total cost can be referred to both in reference to total productive resources applied to a cost object and in relation to total costs of a given category. The first case may be the total cost of production, a concept that groups together all costs applied to production, while the second case, for example, is the indirect cost of a cost section or of the company. (Enguídanos, 2009, pág. 75).

Material Cost / Total Costs. Ratio of material cost to the total costs of the company.

EBITDA. A financial indicator that seeks to measure earnings or profit achieved by a company or project, without taking into consideration taxes, financial expenses and other accounting expenses that do not involve cash outflow, such as amortisation, interest, taxes and depreciation. (Economía, 2016).

Shareholder Equity. Funds provided by investors holding shares, bonds, etc.

Total Liabilities. Total value of resources financing company assets. They must be equal to total assets.

Shareholder Equity/Total Liabilities. Ratio of shareholder equity to total liabilities held by the company.

Operating Revenue (turnover). Total revenue a company receives as a result of its activity. These revenues stem directly from economic transactions carried out by the company over a given period of time. In addition, the concept of turnover directly encompasses the total value of goods and services the company has sold and provided on a day-to-day basis.

Profit Margin (%). The positive difference an organisation expects to achieve once total revenues are reduced by total costs, always within an accounting period. In most institutions, the reference period is one year, although, depending on their needs, it can also be quarterly or half-yearly. (Economía, 2016).

Number of Employees. Volume of direct company employment during a financial year.

Solvency Ratio. One of the key metrics for measuring a company's ability to meet its debts and other obligations. Solvency ratio is used to indicate whether the cash flow, i.e. the money available to the company, is sufficient for it to meet its short and long-term debts. It also takes into account the depreciation of company assets. In other words, it measures the ability to meet all obligations and not just debts. (Economía, 2016).

Earnings before Tax. The total of the sum of the operating profit (the company's main activity) and the financial profit.