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The Shipbuilding and Naval Repair Sector in the Atlantic Area

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ABSTRACT

Maritime activities are one of the key elements of the Lisbon Strategy. According to the European Union, those sectors related to the exploitation of the seas represent 3-5% of the Union GDP. Those sectors have contributed to the building of the Atlantic Area identity. Some subsectors from the maritime economy face tough times, while other offer great opportunities for economic growth and employment. In this context the HARVEST ATLANTIC (Harnessing All Resources Valuable to Economies of Seaside Territories on the Atlantic) project is developed, approved by the Atlantic Area Interreg IV-B Program.

This study includes the main results obtained from the above mentioned project related to the shipbuilding and repair sector in four countries from the Atlantic area (Spain, Portugal, Ireland and Scotland). The surveys that were conducted among companies from the sector included different aspects related with their location, innovation, human capital and policy making.

1. Introduction. The Shipbuilding and Repair Sector

The shipbuilding sector is completely globalised and it is defined as a synthesis industry that produces a singular product, rarely into serial production, with a high unitary value and a long period of construction, very sensitive to the economic cycle, with almost permanent global excess capacity, and subject to a fierce international competition (CESA, 2011; CCOO, 2012; Zuhal, 2008).

Key Features:

Specific financial constraints. They are higher than in other sectors.

Sensitive world trade changes. Now the sector is frankly in decline with respect to the demand of new ships.

Competition. It mainly comes from the States which adopt an interventionist approach concerning the shipbuilding industry and which consider the shipbuilding sector to be important strategically speaking.

Strategic importance in the national economies. Due to its high technological content, its role as a provider of essential means of transport for the international trade; of research, exploration and extraction of energetic products, and specially its role as a provider of advanced military vessels.

In the following sections, the main results obtained from the shipbuilding and repair sectors in the Atlantic area will be presented. Therefore, first, the value chain is described and the general market situation is analysed. Secondly, the European regulatory framework and the European strategic framework of the shipbuilding and repair sectors are analysed. Thirdly, some aspects related to location, innovation, human capital and pol-

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Figure 1: General structure of the supply chain in shipbuilding and shipbuilding and yacht building (RDT+i)

Source: Own Elaboration

icy making in the shipbuilding and repair sectors in Harvest regions are studied. Finally, policy implications and conclusions are stated.

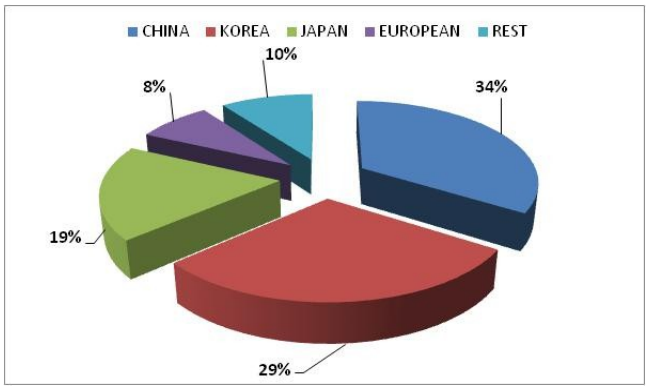
2. Value Chain of Shipbuilding and Repair

Supply chain research from shipbuilding and construction of yachts (RDT+i), incorporates a range of activities in which they can innovate and, therefore, they are directly or indirectly an input to innovation (González, 2008).

The subsectors that integrate the shipbuilding and repair sector value chain are shown in Figure 1. The activities developed by those subsectors are listed below:

1. Project Preliminary draft; Consulting design and R&D; Project engineering; Reengineering; Analysis of technical, economic, financial and commercial feasibility, construction of ships and recreational craft; Research activities.; research and innovation in the following activities related to shipbuilding (projects, supplies, equipment, transformation, marketing, operations and maintenance).
2. Supplies Equipment for dwellings (bridges, cabins, kitchens...); Radars and beacons; Communication equipment; Aid to navigation teams; Cooling systems; Elevators and freight elevators; Lubricants; Wiring; Paints, insulating and sealing; Woods; Engines and turbines; Rope; Electronics and electrical panels; Propellers and propulsion equipment; Rudders and rudder; blades Inflatable boats; Covers and upholstery; Boiler.

Figure 2: World Market Situation on a country basis



Source: CLARKSON. Own Elaboration

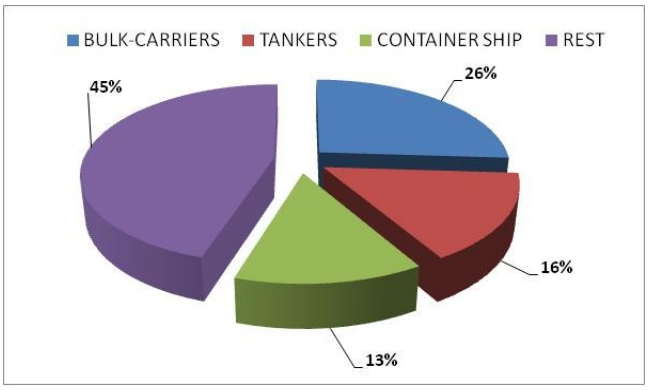
3. Equipment Cranes, bridge cranes and handling equipment; Cutting machines; Machinery of forming; Welding equipment; Industrial buildings; Harrows; Facilities; Computer equipment.
4. Transformation Steel for shipbuilding; Structural elements and pipelines; Engines and equipment incorporated; Construction and repair of ships; construction and maintenance of fishing vessels; Construction and repair of small boats and pleasure boats; Transformation of boats.
5. Marketing Chartering of ships; Rent small boats and recreational; Ship repair services; Sale of ships; Yachts for sale.
6. Operations and Maintenance Maritime transport services; Port services; Port infrastructure; Marinas; Stowage of goods; Consignment; Mooring of vessels; Maneuvers of dockage and moorage; Towing of boats; Telecommunications services; Maintenance services; Services of insurance and classification of vessels; Repair shops; Nautical tourism; Nautical training.

3. Market Situation

The international financial crisis has had a great effect since 2009 and it has led to a significant reduction of the global recruitment level, some delays in delivering and little funding for many ships on order. Global shipbuilding funding mainly depends on the European banking system, critically exposed since 2009 to the credit crisis which is, therefore, wreaking havoc on the shipbuilders' working capital (ECORYS, 2009; Koers and Vaart, 2009; MIET, 2013).

a) World Market situation on a country basis Korea is considered to be the leader of the sector with regard to contracting which is over 43.3% of the total in GCT, followed by China (with 27.1%) and Japan (with 12.9%). In 2012, China achieved the 34%, overcoming Korea which achieved the 29.5% and which is followed by Japan (18.4%) and, at a considerable distance, by the European (8% of the total) and the UE-27 (5.9%) countries. The rest of the world (Brazil, India, Philippines) has again gained market share (10.1%).

Figure 3: World market situation according to the type of vessel



Source: CLARKSON. Own Elaboration

b) World market situation according to the type of vessel Bulk-carriers still are the most demanded vessels, with 23.3% of the total contracts and 26% of the CGT, followed by oil tankers (15.6%) and container ships (13.2%). Special vessels represent around the 47.8% of the total.

4. The Sector at European Level

4.1. General Description of Shipbuilding and Repair at European and Atlantic Area Level

The European shipbuilding and repairing industry is approximately integrated by 300 shipyards. Most of them are small to medium shipyards (60-150 tons vessels) and outsourcing is very important for them, achieving the 80% of the value. Approximately 90% of the orders are for exporting. The market share is around 15% in terms of volume. European ships and the equipment maritime industry employs more than 500,000 people and achieves an average annual turnover of €72,000 million, but it faces a fierce competition and, as many others industries, the effects of an unprecedented crisis.

Market Situation. The European industry is a worldwide leader in building complex vessels, such as cruise ships, cargo ferries, yachts and mega-dredges. It is also well positioned in the construction of submarines and warships. In the civil naval sector, Germany was the country from the UE-27 with the highest level of contracting volume of the European volume in 2012 (29%), followed by Romania (19%), Italy (11%) and Spain (10%).

In Spain, the shipbuilding and repair sector was one of the most important industries between the 1960s and 1980s, going from producing 160,000 TRB in 1960 to 1.8 million in 1980, becoming the fourth world producer with a 4% of the worldwide production, being more than half of it for the export; nearly 200,000 people worked in this sector at that time.

From the 1980s several global crisis, the evolution of the oil prices and the emergence of other developing countries caused that several shipyards closed down and the workforce was reduced. Nowadays, Spain produces 400,000 CGT, very far away from the world's largest producers: China, South Korea and Japan. Regarding the workforce, around 7,000 people work for Spanish shipyards directly, and 10,000 people indirectly in auxiliary companies.

4.2. Regulatory Framework

Since the entry into force of the Maastricht Treaty, the Article 157 of the CE Treaty has defined the industrial policy initiatives which the Commission has used to coordinate the actions of the Member States. This article, which was modified by the Nice Treaty, is governed by the co-decision procedure and gives the Parliament the role of co-legislators, serves as a legal basis for the shipbuilding industry.

The Naval Sector Restructuring in Europe dates back to the restructuring of the shipyards applied by the Member States from 1979. Sanitation of the shipbuilding sector (Council Resolution of 19th September 1978) and aid to shipbuilding industry (Directives 78/338/CEE, 81/363/EEC , 85/2/CEE , 87/167/EEC , 90/652/CEE , 90/684/EEC and 93/115/EEC).

The LeaderSHIP 2015 initiative was launched in 2003, looking for a coordinated response to the challenges that the European shipbuilding sector faces. Attention has focused on knowledge - based activities and on the need for a better return of the significant investments made by the shipyards in research, development and innovation.

4.3. Strategic Framework

Taking into consideration the negative impact of the crisis on the UE shipbuilding industry, in 2011, the Competitiveness Council reviewed and updated the LeaderSHIP 2015 strategy. This process concluded with the approval of the LeaderSHIP 2020 initiative in February 2013. Its aim is to use more widely the EU instruments to boost new skills and qualifications, to promote public-private partnerships to do new maritime research, to look for new financing opportunities from the European Investment Bank (EIB) and to develop regional specialization strategies. In short, Leadership 2020 wants to give an up-to-date political response to the challenges of the industry, to promote the necessary sectorial changes and to contribute to a really competitive and sustainable industry.

The new strategy includes recommendations for short and medium term, proposing actions in four main areas:

1. Employment and competition. It is sought to use EU programs that allow the mobility promotion and the harmonization of accreditation systems, in order to satisfy the market needs and improve employability (Social Change and Innovation Program 2014-2020).
2. Improvement of market access. It is sought to analyse new ways of regulating the unfair and unsustainable market practices, in order to design a new framework to include the "common objectives" in the European public tenders, and apply a greater reciprocity in the market opening between the EU and other countries.
3. Access to finance. It is aimed to look for new financing opportunities from the EIB. It is the most important factor due to it will allow to:

a) Compete for the shipbuilding contracts in the international market, in projects related with the ecological shipping, high seas renewable energies and modernization.

b) Establish measures to finance ships in the long term.

c) Create public-private partnerships respecting the rules about state aids.

4. Research. It is aimed to assign the 2014-2022 Structural Funds for the diversification of the maritime technology industry in new market sectors, especially in the regional strategies for the intelligent specialization.

5. The Sector Within the Harvest Regions

5.1. Description of the Sector in the HARVEST Regions

Cantabria is one of the smallest regions in Spain, with a population of 600,000 inhabitants and an average per capita income of €23,000. It is characterized by its good infrastructures, roads, port and airport which provide a good capacity for its economic development. 31% of the population are involved in the industry, with a decline of the heavy industries (metalworking, shipyards, paper industry, chemical industry, and mining industry) and an increase in the small industry.

The shipbuilding and repair sector in Cantabria is integrated by a medium size shipyard and about a hundred auxiliary companies and repair shops. The sector has undergone restructuring over the years, mainly due to the emergence of cheaper labour force in developing countries, emerging the need of offering something additional to the customers: innovative products, new methods and processes, more efficiency, more quality, less polluting products, etc.

The sector prices and the routing of vessels are the main factors influencing the activity. Thus, the main customers are the ship-owners with established routes in the North of Europe. As a result, the main markets are Norway, Germany, United Kingdom, France and Holland. Among these countries, especially in the United Kingdom and Norway, the "off-shore" market related to oil and gas is highlighted. It is a market in which process, material and equipment innovation is on the rise. It has also the advantage of being a market that is not economically suffering from the crisis as the other traditional markets of dry cargo, bulks, container ships or chemical products.

The origins of the shipbuilding and repair industry in **Portugal** date back to the formation of the nationality, having suffered a major development with the start of overseas expansion and the Discoveries, from the fifteenth century, which continued until the last century. These industries also had great importance in the industrial development of our country in the twentieth century and, since they are traditionally receiving industries of labour intensive force, had obvious implications in the social sphere, whether in terms of employment or in terms of training and technique. This industry is characterized by three or four yards with higher dimension, and its fragmentation into dozens of small and medium enterprises, not relevant (Comissão Estratégica dos Oceanos, Portuguese Government)[11] .

Nevertheless, this business structure corresponds to the existence of skilled labour and is applied to various construction materials, including steel, aluminium, fibre and wood technology. In a strictly economic point of view, the shipbuilding industry, confined, on one hand, by the limitations of demand and, on the other hand, by the relentless foreign competition, should perhaps not deserve priority attention. However, the situation of continental periphery relative to the European continent and nature of the State, almost archipelagic, features Portugal as an oceanic country. And an oceanic country like Portugal should not give up a shipbuilding industry, having a navy and having an industry (with skilled manpower, know- how and technology) that contributes to the building of this navy. In this broader strategic logic becomes crucial not only to protect the Portuguese shipbuilding industry, but mainly to know how to promote it. In order to achieve this, it is necessary to develop in the country a vision and a strategy for the shipbuilding industry that currently does not exist (Comissão Estratégica dos Oceanos, Portuguese Government)[12] .

The results of the survey conducted among companies in the shipbuilding and repair sector related to aspects such as location, innovation, human capital and decisions are analysed in the following sections. The results related to companies in the shipbuilding and repair sector are compared with the results of the companies in other Harvest sectors, in relative terms.

The composition of the sample, in which the number of repair firms is much higher than the number of companies from the shipyard construction, will be determinant in the analysis of results. However, it seems appropriate to point out that, shipyards also make repairs, due to the crisis in the shipbuilding sector aggravated by the economic crisis. In short, we use the term "shipbuilding and repair" sector in the Harvest regions to mean a naval repair sector.

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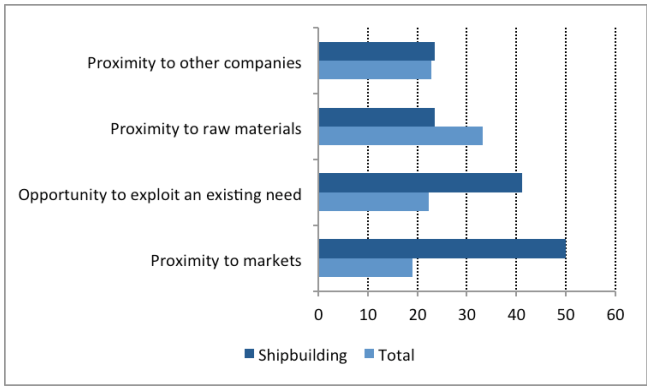
5.2. Location

The reasons that best justify the location of the interviewed companies of the Harvest regions, which work in the shipbuilding and repair sector, are shown in Figure 4. 50% of companies think that proximity to markets is the main factor determinant

[11] http: //www. ordemengenheiros. pt/fotos /editor2 /eng.naval /2relatorio-ceo_ parte_ ii.pdf

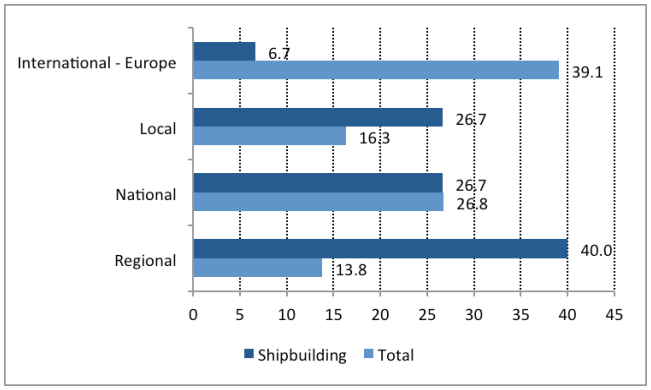
[12] http: //www. ordemengenheiros. pt/fotos /editor2 /eng.naval /2relatorio-ceo_ parte_ ii.pdf

Figure 4: Key factors for the location decision



Source: Own Elaboration

Figure 5: Most significant markets



Source: Own Elaboration

in their location. In a lesser extent, 41.2% of companies think that the opportunity to exploit an existing need is an important factor. Proximity to raw materials and proximity to other companies in the same business or related activities are considered to be determinant factors by 23.5% of companies.

The majority of surveyed companies are ship repair workshops that are located near ports in the Harvest regions. Both commercial vessels and recreational craft make up the main market for the surveyed companies. The location of these vessels creates different needs that are channeled, through the demand, to shipbuilding and repair companies.

Figure 5 shows the location of the most significant markets for the shipbuilding and repair sector in the Harvest regions. According to 40% of companies, the regional markets are the most important ones (located less than 160km from the company). In a lesser extent, local and national markets (located less than 80km from the company) are also important for 26.7% of companies. International European markets are only significant for 6.6% of surveyed companies, in contrast to what happens with the 39.1% of companies in other Harvest sectors.

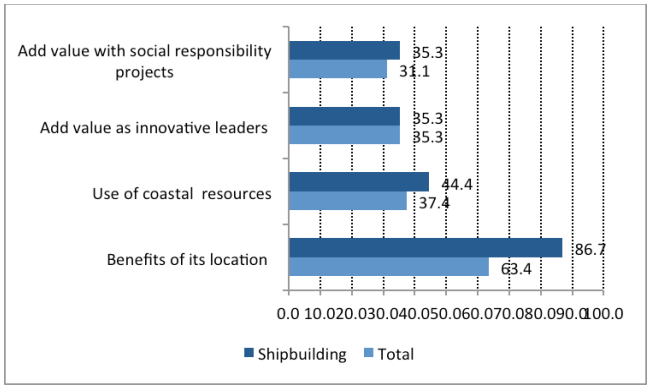
Surveyed companies mainly operate in local, regional and national areas due to repair companies mobility (mainly workshops) is limited to a specific geographical area, usually national. Shipyards make repairs in the same areas and they also operate in the international markets developing other activities of a shipyard (structural modifications, new shipbuilding, lengthening...).

The potential benefits for shipbuilding and repair companies of being located in the Atlantic Area are shown in Figure 6.

In general, surveyed companies from Harvest regions in the shipbuilding and repair sector benefit from its location in the Atlantic Area (86.7%). 44.4% of companies in the shipbuilding and repair sector decided to be located in the area (Atlantic) motivated by the use of coastal resources. 35.3% of shipbuilding and repair companies think that their activities, products and services add value to the image of their regions and the Atlantic Area due to their consider themselves to be innovation leaders in their markets and committed companies to social responsibility projects.

The location of surveyed companies in port areas, no doubt,

Figure 6: Benefits of being located in the Atlantic Area



Source: Own Elaboration

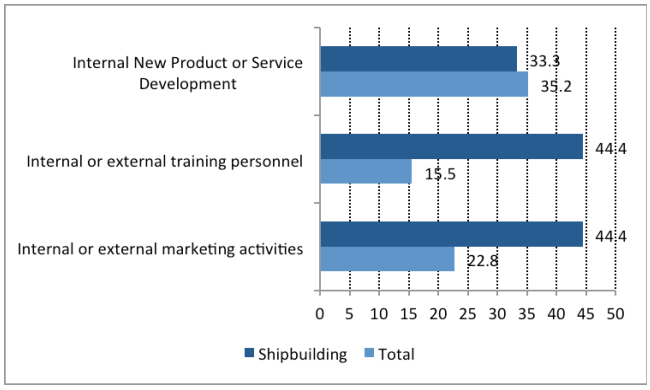
generates location advantages for the shipbuilding and repair companies that operate in the sector. Their location allows them to channel the demand which is focused in commercial and recreational ports. These areas are passage and stay places where vessels demand services. In this sense, companies benefit from the port infrastructures of the analysed regions. Shipyards are innovation leaders in their sector because they have R&D departments and take part in international projects with other companies. These projects are aimed to develop environmentally friendly business strategies (use of less toxic paints, non-polluting cleaning processes...).

5.3. Innovation

In 2012, 46.7% of surveyed companies in the shipbuilding and repair sector participate in innovation activities. In this sense, 44.4% of surveyed companies developed internal or external marketing activities aimed to introduce new innovations and to internal or external training related to innovation. In addition, 33.3% of surveyed companies developed new products or internal services. Figure 7 shows the participation in innovation activities of shipbuilding and repair companies from the Harvest regions.

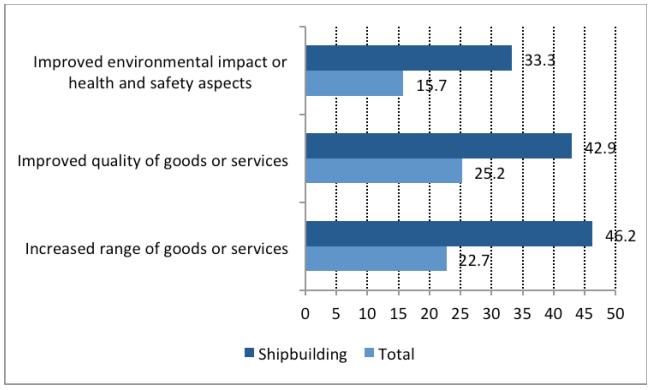
Companies in the shipbuilding and repair sector develop their own strategies and innovation products. In general, the

Figure 7: Innovation activities



Source: Own Elaboration

Figure 8: Impact of the innovation activities



Source: Own Elaboration

Figure 9: Cooperation in innovation activities

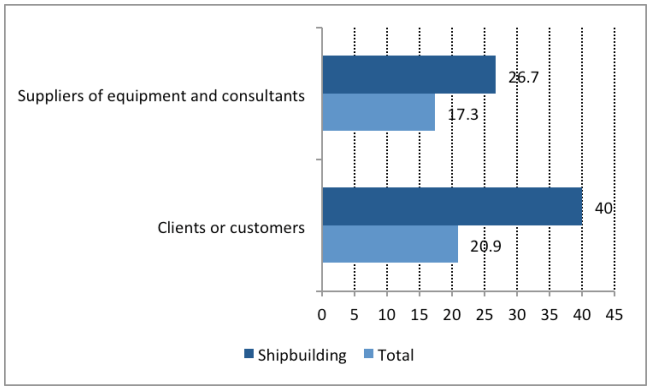


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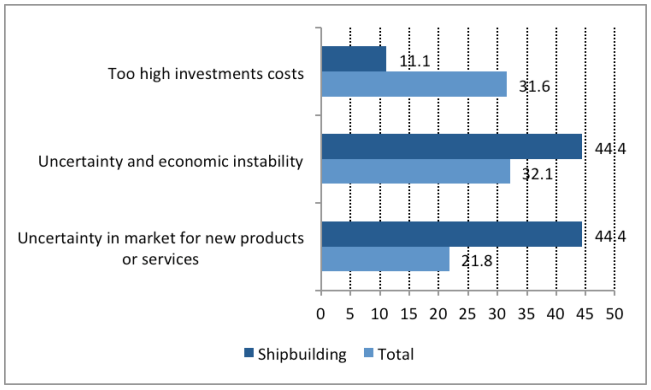
Figure 10: Inhibiting factors of the innovation capacity



Source: Own Elaboration

acquisition of external R&D and equipment related to innovation is not significant. In this sense, companies develop their own sales strategies, products and services strategies and continuous training strategies. The shipbuilding crisis has led companies to review their processes in order to cut down costs and increase productivity. The biggest companies have internalised services.

In the period 2011-2012, these were the results that took place as a result of the innovation activities developed by shipbuilding and repair companies: an increase in quality services (42.6%), an increase in the range of products and services offered (42.9%) and an improvement in health and security issues (33.3%). Figure 8 shows the impact of the innovation activities in the shipbuilding and repair companies from the Harvest regions.

In the period 2011-2012, the sector restructuring that took place in previous years did not have hardly any impact in cost reduction, production capacity, environmental impact improvement and regulatory compliance. Companies had already achieved a higher productivity, although insufficient, to compete with certain products in international markets.

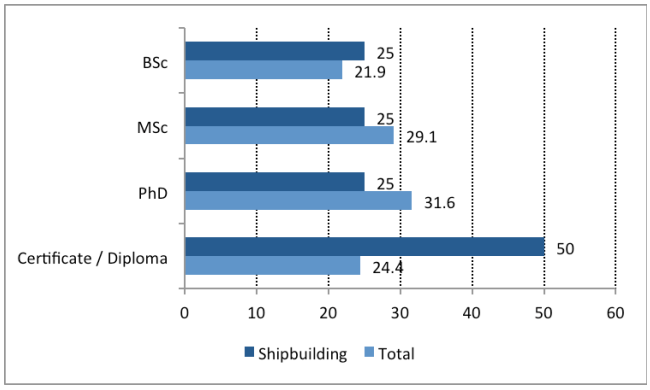
In the period 2011-2012, surveyed companies in the shipbuilding and repair sector cooperate to develop innovation activities with customers (40%) and, in a lesser extent, with equipment, materials, components suppliers and consultants (26.7%). Figure 9 shows the main innovation activities in which shipbuilding and repair companies cooperated.

Companies developed innovation activities with their customers to improve projects requested by their own customers. The cost of their cooperations was absorbed by the budget of the projects. None of the companies cooperated with comercial laboratorios, R&D companies, universities, public or research organisms or private research institutes. The economic crisis minimized the costs in the indicated concepts.

The main inhibiting factor to innovate, according to surveyed companies in the shipbuilding and repair sector, are uncertainty in market for new products or services and economic instability (44.4%). Only 11.1% of surveyed companies considered high investment costs as a key inhibiting factor. Figure 10 shows the inhibitor factor in the development of innovation capacity.

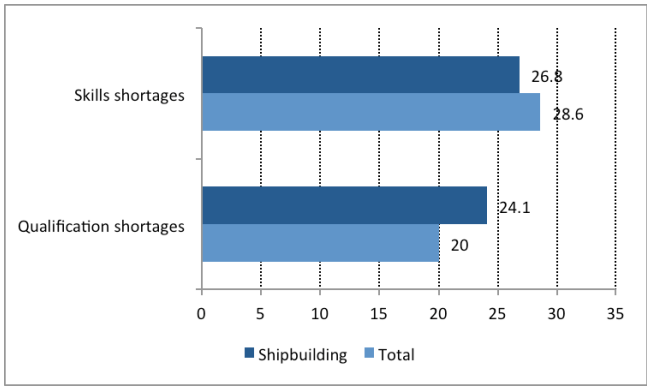
The economic crisis and the existing uncertainty have been determinant to companies when planning their strategies. Big projects have been postponed waiting for the recovery in demand. Companies have not taken decisions about new equipment investments waiting for a change in the markets. The smallest companies (small familiar workshops) have weathered the crisis better.

Figure 11: Human Resources Qualification levels



Source: Own Elaboration

Figure 12: High educations needs



Source: Own Elaboration

5.4. *Human Capitol*

The personnel of 50% of surveyed companies in the shipbuilding and repair sector have an average qualification of Diploma, technical engineer or technical arquitects. 25% of companies have personnel with a higher qualification such as Bachellor, Senior Engineer, Arquitect, MSc or PhD. Figure 11 shows the different human resources qualification levels of surveyed companies in the shipbuilding and repair sector.

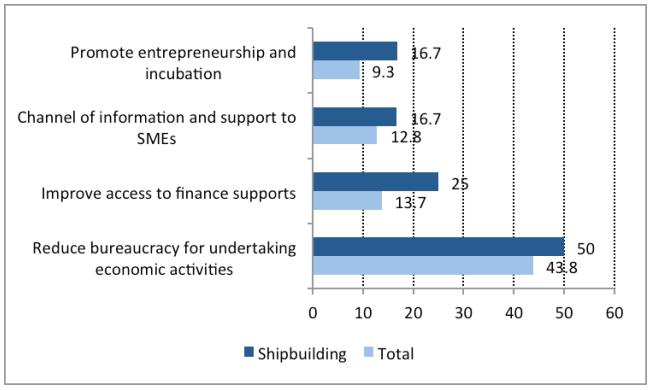
Companies in the shipbuilding and repair sector did not detect skills (26.8%) or qualification (24.1%) shortages that could be satisfied by higher education institutions. Figure 12 shows the scarce qualification shortages of surveyed companies.

Companies in this sector usually incorporate people with a medium qualification and, technical and highly specialised training. We are talking about shipbuilding and repair professionals, with a widely experience. They have highly developed skills. In this sense companies have high qualified and experienced personnel.

5.5. *Policy Making*

Half of the surveyed companies in the shipbuilding and repair sector think that policy makers could stimulate a favourable environment to benefit them by reducing bureaucracy for undertaking economic activities. 25% of companies think that there has been an improvement in the access to finantial support. Equally, 16.8% think that the environment could be improved by creating an effective channel of information and support for SMEs and by promoting entrepreneurship and incubation. There are numerous mechanisms that, in a lesser extent (8.3%), could improve the environment: training and skills development, regulation simplification for undertaking economic activities, promotion of educational policies in the maritime field, awareness-raising and participation in clusters and relevant networks for the sector, and links between the industry and the higher education institutions. Figure 13 shows the different mechanisms that could create a better environment according to the opinion of surveyed companies in the shipbuilding and repair sector.

Figure 13: Mechanisms of stimulus of a favourable environment



Source: Own Elaboration

In the current crisis situation, the main stimulus are the economic and tax aids together with the elimination of the numerous existing bureaucratic barriers. An homogeneous treatment in all European regions is requested from the companies in the sector. The demand for a clear support from the European Union to SMEs is due to the small size of the companies.

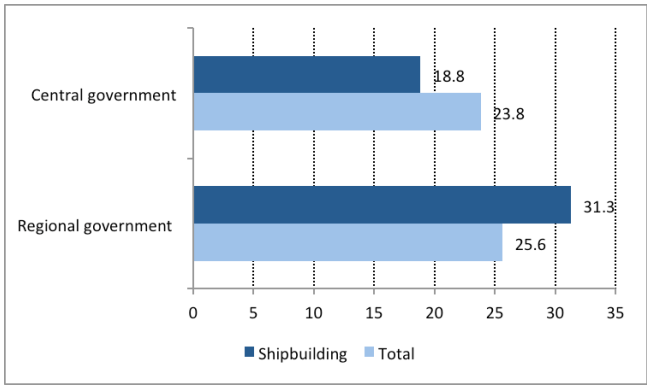
In the period 2011-2012, 31.3% of surveyed companies in the shipbuilding and repair sector received aids from local and regional governments, and 18.8% from the national government. Figure 14 shows the different sources of public aids received by the companies from the shipbuilding and repair sector.

Despite the existing demand, there is not a common aid framework in the European Union for the shipbuilding and repair sector. There is only one special tax treatment (tax lease) for those shipbuilding projects that take at least one a year.

The majority of companies in the shipbuilding and repair sector (61.5%) have less than 10 employees, and 38.5% of companies have between 10 and 50 employees. Figure 15 shows the size of companies in the shipbuilding and repair sector.

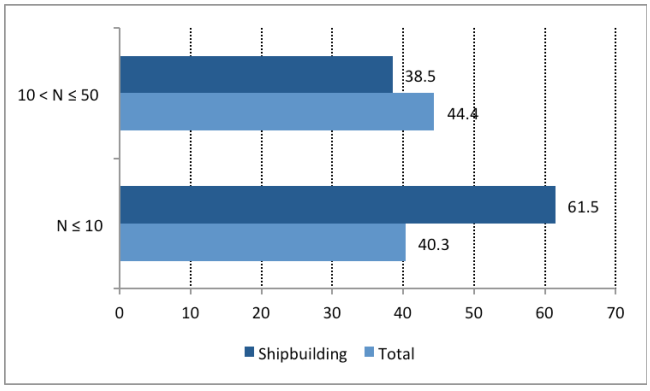
The turnover of surveyed companies in the shipbuilding and repair sector is low. The majority of surveyed companies (73.3%) have a turnover lower than 2 millions, 26.7% have a turnover which ranges between 2 and 10 millions. Figure 16 shows the turnover obtained by the majority of surveyed companies in the shipbuilding and repair sector.

Figure 14: Sources of public aids



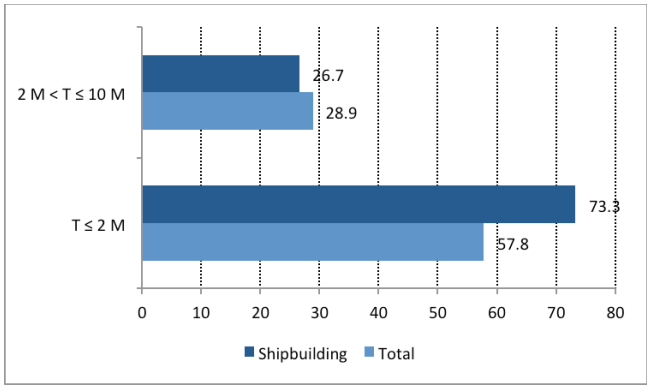
Source: Own Elaboration

Figure 15: Shipbuilding and repair companies size



Source: Own Elaboration

Figure 16: Turnover of companies from the shipbuilding and repair sector



Source: Own Elaboration

Companies in the sector are small and this could be the reason why they have a small number of employees and a low turnover volume.

6. Summary and Policy Implications

6.1. Layman's Summary

The shipbuilding sector is completely globalised and it is defined as a synthesis industry that produces a singular product, rarely into serial production, with a high unitary value and a long period of construction, very sensitive to the economic cycle, with almost permanent global excess capacity, and subject to a fierce international competition.

The Key Features are: Specific financial constraints, sensitive world trade changes, competition and strategic importance in the national economies.

The subsectors that integrate the shipbuilding and repair sector value chain are: Project, supplies, equipment, transformation, marketing and operations and maintenance.

The international financial crisis has had a great effect since 2009 and it has led to a significant reduction of the global recruitment level, some delays in delivering and little funding for many ships on order.

The European shipbuilding and repairing industry is approximately integrated by 300 shipyards. Most of them are small of medium shipyards (60-150 tons vessels) and outsourcing is very important for them, achieving the 80% of the value. Approximately the 90% of the orders are for exporting. European ships and the equipment maritime industry employs more than 500,000 people and achieves an average annual turnover of €72,000 million, but it faces a fierce competition and, as many others industries, the effects of an unprecedented crisis. The European industry is worldwide leader in building complex vessels, such as cruise ships, cargo ferries, yachts and megadredges.

The new strategy includes recommendations for short and medium term, proposing actions in four main areas: Employment and competition, improvement of market access, access to finance and research. The shipbuilding and repair sector in Cantabria is integrated by a medium size shipyard and about a hundred auxiliary companies and repair shops. The sector has undergone restructuring over the years, mainly due to the emergence of cheaper labour force in developing countries, emerging the need of offering something additional to the customers: innovative products, new methods and processes, more efficiency, more quality, less polluting products, etc.

The location decisions of companies are mainly based on the proximity to markets (50.0%).The main markets of companies are the regional (40.0%). Companies benefit mainly from being located in the Atlantic Arc (86.7%).

Companies practice innovation activities through external marketing activities aimed to introduce innovations (44.4%). The impact of innovation activities on the companies was translated into an improvement in service quality (46.2%). Companies usually cooperate with clients (40.0%). The main innovation barriers for companies are the economic uncertainty and instability (44.4%).

Companies' staff have mainly an average qualification of Technical certificate (50.0%). Qualification needs that could be satisfied by high education institutions were not identified (80.0%).

Companies think that policy makers can create an environment conducive to improve the economic activity if they mainly act on the excessive existing bureaucracy (50.0%). Companies receive scarce support from regional governments (31.3%). Companies are mainly small (61.5%) and have a low turnover volume (73.3%).

6.2. Policy Implications

The strategies should include recommendations for short and medium term, proposing actions in four main areas:

1. Employment and competition. To use more widely the EU instruments to boost new skills and qualifications.
2. Improvement of market access. To promote public-private partnerships to carry out new maritime research.
3. Access to finance. To look for new financing opportunities from the European Investment Bank (EIB).
4. Research. Diversification of the maritime technology industry in new market sectors, especially in the regional strategies for the intelligent specialization.

Conclusions

1. Shipbuilding is a globalised sector.
2. The international financial crisis has had a great affect which has led to a decrease in global recruitment levels.
3. Companies practice innovation through external marketing activities, the main barriers are economic uncertainty and instability.
4. There is excessive bureaucracy and little support from regional governments.
5. The key recommendations identified in this report are:
    - The need for improvement of market access
    - The need for access to finance
    - The need to make use of EU instruments to boost new skills and qualifications for employment and competition.
    - The need for diversification of marine technology through research.

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