Ocean and Coastal Management 216 (2022) 105972

Contents lists available at ScienceDirect

Ocean and Coastal Management

journal homepage: www.elsevier.com/locate/ocecoaman

Changes in the Spanish fish-canning industry since Spain's entry to the European Union

Xoán Carmona *

Department of Applied Economics, Universidad de Santiago de Compostela, Avda do Burgo, s/n, 15782, Santiago, Spain

ARTICLE INFO

Keywords:
Fish canning industry
Common fisheries policy
Spanish fishing industry
Fishing history
Canned tuna
Galicia

ABSTRACT

In the early 1980s, just before the entry of Spain in the European Union, the Spanish fish canning industry was already important, although it was still well behind the leading countries. Canning companies were small, exports were low and directed to economically vulnerable countries, the product was highly varied and the economies of scale in the industry were small. Forty years later, the Spanish canning industry is a more concentrated industry, with several large companies that have plants in other countries, and which exports a significant part of its production. It is the leader in the European Union and the second largest producer in the world. The existence of a tradition and important capabilities acquired over time, especially in the Galician region, the consolidation of its own tuna fleet and the entry of Spain into the European Union have been factors that made this change possible.

1. Introduction

Economic integration processes have disparate effects on regions and sectors within them (Baldwin and Wyplosz, 2020; Badinger and Nitsch., 2019). Thirty-five years have elapsed since Spain joined the European Union and there is extensive literature on the effects that incorporation had on its economic development, both general and regional, or sectoral. From the point of view of fishing and its industries, Galicia (North West Spain) is undoubtedly, by tradition and specialization, the most dependent on this activity of all the Spanish regions (European Commission, 2000; Doldán et al., 2005). For this reason, on the eve of European integration, it was in Galicia, where both fears and hopes regarding the impact that it could have on maritime industries, were greatest.

Indeed, the effects of integration on the different sea related activities were quite different. Probably the worst performing sector was shipbuilding, whose strong growth during the previous two decades had been heavily subsidized (Valdaliso, 2018; Carmona and Nadal,). The general crisis of the seventies revealed the weaknesses of Spanish shipyards and forced state intervention in most of the largest entities (Houpt and Ortiz-Villajos,1998). Part of the general reconversion process that the shipbuilding industry experienced in the eighties was conditioned by capacity constraints imposed by the European Union which Spain was not able to escape.

More controversial was the evolution of extractive fishing, where the integration of Spain into the Common Fisheries Policy framework meant a significant reduction in the fleet operating in the European fishing grounds (Villasante, 2015; Giraldez et al., 2011) along with an important drop, although not as large, in the freezer fleet. The development of joint ventures, the increase in fisheries in international waters and the recognition by the European Union of the fishing treaties Spain had previously signed with countries that were not members of the EU would explain this smaller reduction in the deep-sea fleet (González Laxe and Macau, 1996).

Unlike fishing and shipbuilding, the manufacturing of canned and frozen products experienced a significant expansion. Especially interesting is the case of the first of these industries, fish canning, which was already a mature activity with a long tradition, but which, in the 1970s - the decade before Spain entered the European Union - was largely obsolete with a very small average size and scarce international presence (Carmona and Fernández-González, 2001). Said state of affairs contrasted markedly with that of the first two decades of the 21st century, in which Spanish fish canning was clearly at the head of the European Union, and, since 2005, on the world stage, second only to Thailand in terms of production (FAO, 2007; García-del-Hoyo et al., 2017). On the following pages we will study the influence Spain's accession to the European Union in 1986 had on this transformation and especially that of two factors that seem to have been decisive: the process of

* Corresponding author.
E-mail address: xoan.carmona@usc.es.

https://doi.org/10.1016/j.ocecoaman.2021.105972
Received 1 July 2020; Received in revised form 15 September 2021; Accepted 8 November 2021
Available online 26 November 2021

dismantling tariffs and the policy of financial aid to the fishing and canning industry implemented as a part of the Common Fisheries Policy. In conjunction with these questions, we will also explore other factors without whose concurrence the eventual success indeed achieved by the Spanish canning industry would not have been possible.

2. Materials and methods

To study the effects of the European Accession on the Spanish fish canning industry we consulted a wide variety of materials. We first reviewed the literature and specialized journals, particularly Industria Conservera, published by Anfaco-Cecopesca (National Association of Canned Food Manufacturers) since 1934. Additionally, we referenced other yearly publications such as Alimarket and Fomento de la Producción. The second group of materials employed were statistical sources, especially Spain's Foreign Trade Statistics (Dirección General de Aduanas, several years) and the Industrias Derivadas de la Pesca series (INE, 1953–1978), the most complete of those that have ever been produced in Spain on the sector. For subsequent years, we had the Encuesta Industrial de Producto and Encuesta Industrial de Empresas (INE, 1983). Finally, within the statistical sources, handwritten published information prepared by Anfaco-Cecopesca (formerly the Union of Canned Food Manufacturers of Galicia) was very useful and can be found in the archive of Funpromar in the city of Vigo. Also within the manuscript sources we drew on the documentation relating to the evolution of tuna fishing contained in the Archivo General de la Administración (Alcalá de Henares-Madrid). For the study of the effects of the integration of the Spanish canning industry in the European Union we also researched, in addition to the sources already mentioned, the publications of the European Commission and DG Mare, supplemented with information from the aforementioned Funpromar.

Finally, it should be noted that most of the sources indicated are not available online, with the exception of ECEE, although Funpromar currently has an ambitious project to digitize its materials (which includes the complete collection of the journal Industria Conservera) that will soon facilitate the study of this important sector.

3. The principal characteristics of the industry's evolution

The first Spanish fish canning factories were established as early as the 1830s, not long after the first French start-ups (Marie D'Avigneu, 1958; Dubois, 2004), although the consolidation of this activity as a true industrial sector still had to wait until the 1890s (Carmona, 1985). It was then that the Spanish canneries gained access to supplies of oil and tinplate on competitive terms and grew rapidly until the eve of the Great Depression, ranking just behind the United States and Japan, almost on the same level as Norway and Portugal (Carmona, 1995). The industry's principal specialization during that period was the processing of sardines (*Sardina pilchardus*) caught in the waters off the coast of Galicia and the north of Portugal which was almost entirely destined for export, mainly to France, Italy and Argentina. In smaller quantities, anchovy (*Engraulis encrasicolus*) and albacore (*Thunnus alalunga*) were also canned in Spain and, unlike the sardine, were sold both in domestic markets as well as abroad.

More than half of the Spanish factories at that time were located in Galician ports (NW Spain), mainly in Vigo (see Fig. 1), which, at the turn of the century, was already the capital of the Spanish canning industry. Anchovy canning, born under Italian influence (Escudero Domínguez, 2007), saw its presence limited to the coastal regions of northern Spain (Asturias, Cantabria and the Basque Country) which also canned albacore (Escudero Domínguez, 2000; Ocampo Suárez-Valdés, 2006; López Losa, 1997), whereas Bluefin tuna (*Thunnus thynnus*) was fished and processed mainly in Western Andalusia where sardines were also packed (Ríos Jiménez, 1999; Ríos Jiménez, 2005). In every case, the industry

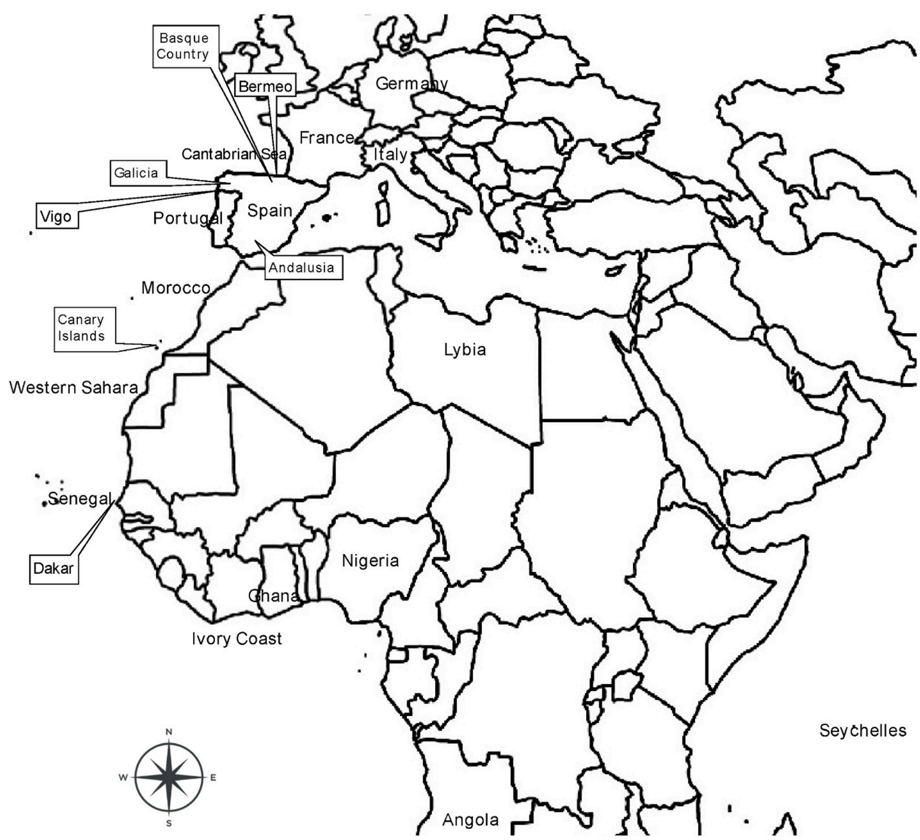

Fig. 1. Countries, cities and regions most frequently cited in the text. (1:60.000.000).
Source: Author's elaboration

makeup was that of processing species fished by local fishing companies in the coastal vicinity of each producing region (Carmona, 1995; López Losa, 1997; Díaz de la Paz, 2012).

Spain experienced a terrible Civil War between 1936 and 1939 followed by a long-lasting dictatorship under the rule of General Franco. The Spanish economy was isolated from the rest of Europe during the 1940s and early 1950s and subjected to heavy state intervention. The fish canning industry, formerly focused mainly on exporting, was confined to its domestic market and subjected to ferrous production and price controls for two decades. Additionally, during this time the industry also experienced the greatest drop in sardine catches ever (1946–1955) which left the sector in a critical state of affairs (Carmona and Fernández-González, 2001). It was during these years, as a response to the lack of sardine, that the development of mussel (*Mytilus galloprovincialis*) growing began to take place in the Galician estuaries, which, in turn, gave rise to an increase in the supply of this mollusc for its canning facilities (Fernández-González, 2008; Fernández-González and Giráldez, 2013). At the same time, the packing of cockles (*Cerastoderma edule*) and of cephalopods gained importance as well. Molluscs such as cockles, octopus, squid *(Loligo vulgaris*), and, above all, mussels, thus became part of the sector's customary offering as early as the 1960s. Especially in Galicia, where there was higher availability of these natural resources, the variety of canned species expanded significantly during the 1950s, even if total production did not.

When the severe governmental economic intervention, in particular, that of foreign trade, began to ease in the 1960s, the industry found itself obsolete and absent from an international market to which it seemed impossible to return. Having been excluded from the newly created European Common Market, Spanish canners endeavoured to improve their sales both in the domestic market, as well as in export markets other than Europe, although always with an eye on the latter, into which they aspired to integrate sooner or later. The general growth of the Spanish economy during that decade, and in particular the boom in tourism, favoured the expansion of the domestic sales. As for the second, some African countries like Nigeria, beneficiaries of the oil prices rise of the seventies, started to buy Spanish canned sardines in significant quantities. However, this sardine was no longer the one that came from Galicia, whose catches had been substantially reduced (Wyatt, 2002), but the fish caught in the Saharan fisheries and canned in the Canary Islands (Díaz de la Paz, 2012). All that still facilitated a relatively important growth in production though, for most companies, of seasonal nature, based on the processing of fish caught close to the factories and with technology little changed from that of before the Civil War.

Although during the sixties and seventies the main export product of the Spanish canning industry was the Canarian sardine and its destination was the African countries, from the beginning of the 1960s, small shipments of canned tuna were beginning to be sent to the USA. But the scarce supply of tuna caught by the Spanish fleet and the growth in demand for this species in the domestic market - driven by the new sun and beach tourism that grew exponentially in the sixties - caused a sharp increase in the price of albacore. If the industry wanted to expand exports, it would have to follow the example of the North American or French manufacturers and extend canning to species with lower market prices.

Some companies had started as early as the 1960s to look for new and cheaper tuna in the Gulf of Guinea fisheries to meet the growing demand for this species in the Spanish domestic market and, to the extent that they could, export to the United States. To this end, in the late 1950s, a group of vessels from the Basque port of Bermeo had initiated pole-and-line fishing for yellowfin (*Thunnus albacares*) and skipjack (*Katsuwonus pelamis*) tuna off the coasts of Senegal and the Ivory Coast, and within a few years, by around 1964, they had started using larger freezer purse seiners. By the beginning of the eighties they had reached the Western Indian Ocean such that tuna supply for the Spanish canneries had undergone a dramatic improvement (Cort, 2011; Ferarios Lázaro, 2013; Ugalde Zabala and AuthorAnonymous, 2015). The adaptation of canneries to the work of the tropical tuna (basically the two aforementioned species) required investments in freezing, processing machinery, and in stocks, and only a small group of companies were in position, and had the resolution, to carry that out (Carmona, 2017).

As can be seen in the Fig. 3, by the end of the seventies, the canning industry was still an activity mainly focused on the valorisation of local, or relatively close in, resources. The sardine continued to maintain its primacy in terms of volume, although in terms of value it lost that position in 1976. Notwithstanding, a new product had now been introduced into the sector, tropical tunas, which implied an internationalized activity dependent on fishing in distant waters. The latter was a minority sector, but growing, and some canners had even initiated their own fishing (Carmona, 2017).

Despite the growth of exports that had taken place during the sixties and seventies, sales of the canning sector as a whole continued to be mostly to the domestic market. In fact, in the 1974–1978 period, exports represented only 27% of product volume. The African countries to which we have referred to before were the main export customers, taking in 39% of foreign sales (Table 1). The European Common Market (later to be integrated into the EU) was a distant 27% of the total. Ghana, Angola, and, above all, Nigeria, were the destinations for the majority of Spanish sardine preserves processed mostly in the Canary Islands, while the same product from the Spanish peninsula was sold in smaller quantities, above all to Czechoslovakia. Tuna and mackerel went to Germany, the United Kingdom, France and Italy, all of which were European Common Market countries, and all of which also bought mussels. Switzerland, which was a primary market for tuna, and the United States, for anchovy fillets, completed the list of clients of importance.

Source. Author's compilation from INE (1974–1978). Value is in millions of pesetas (Spanish currency at that time)

4. Hopes and frustrations of European Accession: the transitory period (1986–1993)

In the early eighties, the Spanish canning industry suffered a series of shocks that translated in a sharp fall in sales. The first of these was the economic crisis in the group of African countries that had grown during the previous decade, boosted by the favourable economic conditions created by oil prices. Nigeria, Angola and, to a lesser extent, Ghana had become the main customers for the Spanish canned sardines, while Libya ranked first as canned tuna importer. The price of oil had peaked in 1979, but its subsequent decline, especially from 1984 onwards, reduced the income of African states, increased their foreign indebtedness and restricted their external purchasing power (Adepoju et al., 2007; Babatunde, 2013). Spanish canned fish exports to the Gulf of Guinean countries had already began to suffer going into 1982, and they practically disappeared during the second half of the decade. Demand from Nigeria, which had been the largest sardine market for Canary Island producers, peaked that same year, with its purchases falling by half the following year, and completely disappearing by 1987. The African debt crisis also affected tuna exports to Libya, which peaked in 1981, precisely the year in which the country, immersed in internal and external conflicts, it abruptly suspended payments, causing important losses for Spanish exporting firms, and even prompting some bankruptcies.

The other Spanish canned fish markets also had their "annus horribilis" in 1981. Distrust of the Spanish food market caused that year by several batches of denatured rapeseed oil unfit for human consumption extended to fish preserves, which, without having being ever contaminated themselves, saw domestic demand fall sharply. That same mistrust caused the closure of the Italian and Swiss borders, and a greater rigor in health controls for Spanish canned products in Germany. Sources in the sector estimated a 30% drop in sales as a consequence of this incident (Garavilla Legarra, 1984).

As a result of all these events, Spanish production and export of canned fish declined sharply in 1982 and 1983 (Fig. 2). This critical

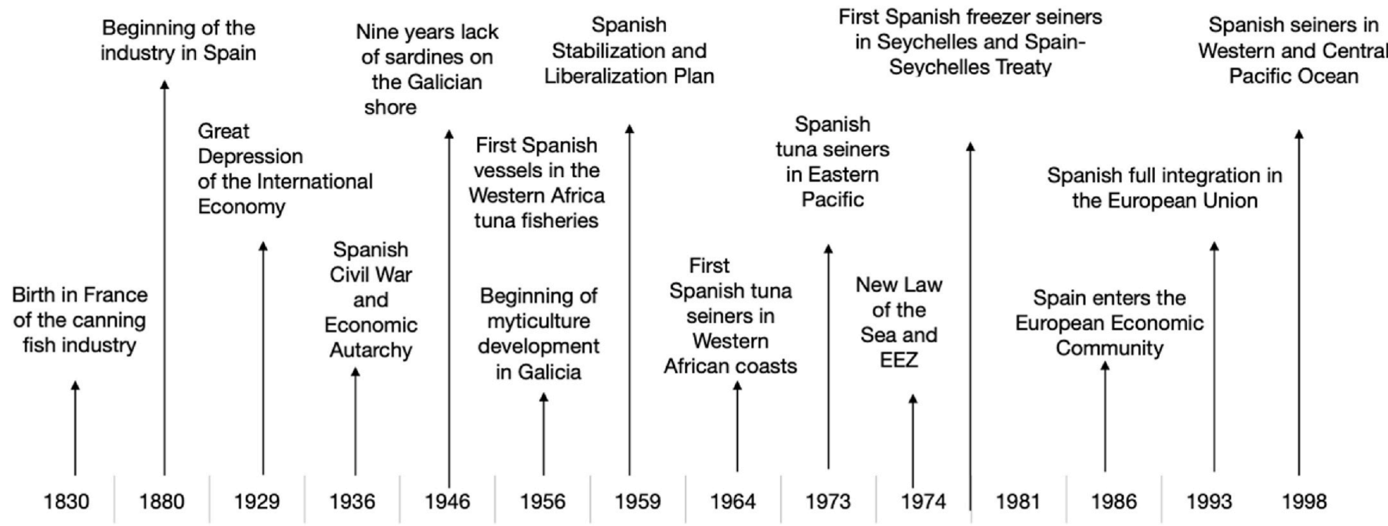

Fig. 2. Some milestones in the history of the Spanish fish canning industry.
Source: Author's elaboration

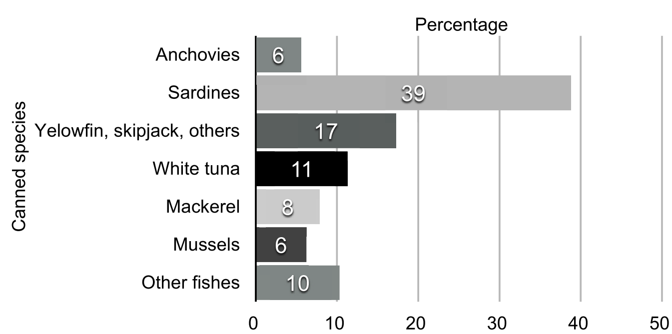

Fig. 3. Spanish production of canned fish broken down by species (quantities). Average 1974–1978.
Source. Estadística (s) de las Industrias Derivadas de la Pesca

Table 1
Destination Spanish exports of fish preserves 1974–1978 (annual average).

	Volume (t.)	Ratio (%)	Value (€)	Ratio (%)
European Comm.	14,921	27	1538	27
Africa	21,422	39	1742	31
Other countries	18,686	34	2344	42
Total exports	55,029	100	5622	100

situation led the sector to follow with keener interest, and hope, the course of the negotiations for Spain's entry into the European Economic Community, whose process had begun in 1979. From the standpoint of size, proximity, and being traditional consumers of canned foods, countries like Italy, France and England, already integrated into the EU, represented new potential consumer markets for the Spanish canneries and raised hopes for industry consolidation. These hopes were especially important for those companies that had taken steps towards specialization in tropical tuna. In the words of one of their most prominent industrialists:

> *"Our grand illusion is abroad; our future as fish canning companies lies in what we can do once we enter the Common Market. We know that there are 280 million consumers and, in round numbers, 160,000 tons of tuna are consumed there. Spain currently consumes around 65,000 tons" (*Garavilla*, 1984, p. 34)*

The problem was that since Spain was located at the margin of the European Economic Community, exporting to the previously mentioned countries was an impossible task due to the fact that Common Market import tariffs were higher for Spanish canned products than for those coming from countries belonging to economic areas with which the Community had signed trade agreements. This was the case of Portugal who had an important sardine canning industry and was part in the European Free Trade Association (EFTA) and the old French colonies (Morocco, Senegal, Ivory Coast) that had French capital canneries in their territories. In general terms, it could be said that compared to tariffs of around 12–15% "ad valorem"[1] for those countries, 25% was being paid on Spanish products (Table 2). This preferential treatment was also further exacerbated by the existence of duty-free quotas on various sector products from those countries.

All this - to which the wage differential between Spain and competing countries was still another impediment - resulted in an extremely limited presence of Spanish preserves in the European Economic Community. Average annual exports to a large consumer of tuna, such as Italy, stood at an insignificant figure of 640 tons for the five-year period 1980–1984, with those of the United Kingdom even further below still, and those of France being practically non-existent. Overall, Spanish exports to the European Economic Community represented only 16.50% of the total of the already relatively low export sales for the sector at that time.

For the canning sector, in profound crisis, with its main export

Table 2
European Common Market import tariffs for canned fish from its main suppliers. Year 1980

	Spain	Portugal	Morocco
Sardine	25% ad valorem 6% aditional duties	15% ad valorem	10% ad valorem Free quota: 1.680 Tm.
Tuna	24%	16,8%	9,6%
Bonito/ Mackerel	25%	12,5%	0%
Anchovies	25%	17,5%	0%

Source: Gómez Navarro, 1981

[1] An "ad valorem" tariff is a duty levied as a percentage of value of the services or goods being imported.

markets utterly sunken, and with domestic consumption of 3.46 kilos per capita in 1981, already very high in international terms (INE, 1983), integration into the European Union (at that time still **the** European Common Market) was the primary hope for resuming the path of growth. However, those hopes were dampened during the 1983 negotiations that would lead to the 1985 Treaty of Accession as it became clear that the sector would have to wait even longer for its much desired tariff dismantlement. The transitional period for fish preserves was finally set at seven years during which import taxes would be reduced in segments, only reaching complete dismantlement in 1993 (Vázquez, G. et al., 1996). An exception was established for canned sardines, in which case the disarmament was to be even slower, not reaching zero tariffs until 1996. Moreover, duty-free quotas were also maintained for canned sardines from Morocco, which, in practice, ended up being extended for several more years (Vieites, 1998; García González, 1996). Complaints from the Spanish sector had little or no effect on negotiations, and pessimism spread amongst the sector.

The nominal and real appreciation of the peseta (the Spanish currency prior to 1999) that occurred within the European Monetary System over the first few years of integration into the European Union was another additional limiting factor on exports to Europe (Aixalá, 1999). Both factors together resulted in that, as can be seen in Fig. 4, although exports to Europe grew in the years immediately after accession, growth was not sufficient enough to compensate for the loss of the older African markets, such that, by volume, total exports were not to reach the levels of 1981 until the mid-nineties. In any event, entry into Europe did promote, albeit modestly and to varying degrees, sales to Europe, and, in particular, molluscs to Germany and tuna to Italy, with the latter accounting for the majority of growth in exports during the period.

But perhaps the most important effect that accession had on the sector during these first early years was its contribution to laying the foundation for its subsequent competitiveness. On the one hand, the importation of capital goods was facilitated, since tariff dismantlement did liberalize the importation of most of these types of goods from the time of the signing of the Accession Treaty to the EU. The Spanish food industry would stand out in the following years precisely due to the intensity of its renewal of capital goods (Ministerio de Industria y Energía and Secretaría General Técnica, 1986 et seq.), and, in the case of canned fish, the possibility of importing duty-free machinery meant that investments made in 1986 (the first year of accession) would multiply by five the previous year's (Ministerio de Industria y Energía and Secretaría General Técnica, 1986).

On the other hand, Accession would also force companies to adapt and bring their products into line with health and labelling legislation required to sell in the Common Market, which also meant a considerable effort for the companies, but which, as we shall see in the end, would be crowned with success. Finally, entry into the European Community would allow them to become better acquainted with the characteristics

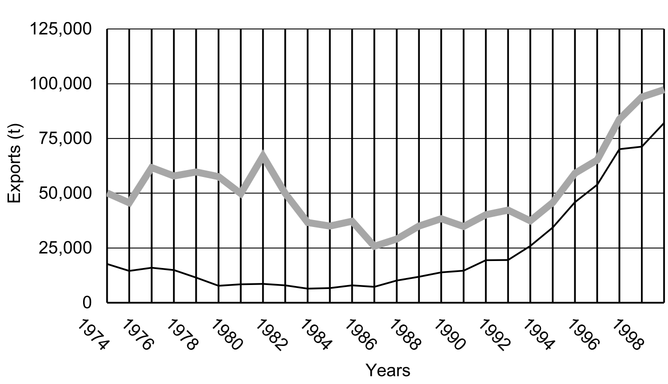

Fig. 4. Spanish canned fish exports during the period 1974–1999.
Source: ECEE.

of its internal market and confirm that it was in tuna that the best prospects for demand were to be found.

What accession did not do was stop the steady stream of closures of companies that had been happening since the sixties and that had accelerated during the first part of the eighties due to the crisis to which we have already referred. During these transition years (1986–1993), it was necessary to invest in technology and food safety, and many companies were not in a position to do so, and, as such, decided to leave the sector. Others did try, either by venturing to enter the new tuna segment processing yellowfin and skipjack, or by intensifying an existing commitment in the canning of these species. But in the context of double-digit interest rates many of them were brought down either by supply problems, or prices from that species, or by other problems that the sector experienced during those years of transition. Among the latter were, for example, the red tides that affected Galician mussels in 1986 causing the paralysis of several shipments to Germany and Switzerland the following year, or the problems with the supply of sardines as much in Galician as in Saharian waters**.** The first case stemming from the sharp decline in catches during that time (Carrera and Porteiro, 2003)**,** and in the second from the ending in 1976 of the Spanish colonialism in Western Sahara resulting in the loss of access to those fishing grounds on the part of the Spanish fishing fleet operating in them.

The fact is that during the years immediately leading up to accession, as well as the years between it and the application of the Maastricht Treaty, many historical companies went into liquidation. In Galicia this was the case of the two traditional leaders of this industry, Curbera and Massó, and of other important firms such as Peña and La Onza de Oro. Canary Islands companies were also among the most affected and the two largest ones, Rocar and Lloret y Llinares, also closed their doors during these years.

5. Tariff dismantlement and the consolidation of a new Spanish canning industry

For Spain and Portugal, the signing of the Single European Act in 1993 signalled the end of the transition period and full integration on equal terms within the European Union. This finally meant tariff dismantlement for one and all and being part of a single domestic market with one common external tariff. It is true that exceptions were maintained for sensitive products and that exempt, or quasi-exempt, quotas continued to be kept for some products, such as preserved sardines from some countries, thereby lessening the advantage that the canning sector should have enjoyed by right of being a full member of the European Union. The sector complained about agreed upon quotas for Moroccan canned sardines, but, all taken together, tariff dismantlement was, as we will see, a grand, decisive event for Spanish fish canning exporters. In addition, two other factors favourably influenced this industry during the nineties: the deterioration of monetary parity and the aid established by the Common Fisheries Policy for the restructuring of the fishing fleet and the expansion and modernization of the processing industry.

As it was, tariff dismantlement occurred almost simultaneously with a chain of devaluations in the Spanish currency putting to end the overvaluation of the peseta that had been one of the factors that had also contributed to limiting growth of Spanish exports to Europe during the transition period. The European Monetary System crisis of 1992-93 caused the withdrawal of speculative capital that had gone into Spain during the economic expansion of the second half of the eighties seeking out the high interest rates caused by both the strong growth in domestic demand and the foreign trade deficit. The response of the economic authorities was to force three devaluations between September 1992 and March 1993 that reduced the exchange rate of the peseta by 21% (Aixalá, 1996; Viñals, 2004).

In this setting, Spain's access to the Single Market took place, with a very favourable monetary parity, a circumstance which, when added to the conclusion of the tariff dismantling process, was decisive in promoting strong export growth to the European Union over the following years (Fig. 5).

This strong growth in exports to the European Union, which contrasted with the stagnation of more traditional markets such as those in Switzerland, Czechoslovakia or the United States, and the definitive disappearance of sardine exports to African countries, led to a progressive concentration of Spanish exporting on the European market. Next to Italy, where sales that had already started to grow in the transition period were taking off, France was being vigorously included as a destination for the same product, and to a lesser extent, the United Kingdom and Portugal as well. By the beginning of the 21st century, a radical reconfiguration of Spanish export destinations of canned fish had occurred, with the European Union accounting for figures of around 85% of the total (Fig. 6).

The reorientation of exports towards the European Union led to an adaptation to Italian and French consumer preferences, with their inclination for tuna, as well as, albeit to a lesser extent, for preserves for which there were no quota authorizations for third party countries, such as was the case with mussels or cephalopods. On the other hand, the difficulty of competing with sardines from other sources, such as Morocco, as well as limitations in the Spanish supply of this species, would condemn this preserve to marginalization in the European market, and Spanish production to stagnation. In this manner, as seen in Fig. 5, the reorientation of the export market caused by the events of 1992-93 also translated into a tune-up in exports that took tuna from representing percentages always below 20% before 1986 to figures situated around 70% by the end of the century. Spanish exports of canned fish were already at that time an export to Europe in which tuna was by far the dominant product. Within Europe, Italy and France were the core markets, with mussels trailing tuna, but both at the top of a varied product panel that included sardines, anchovies, mackerels and other molluscs.

The importance of export growth to Europe in the nineties can be more clearly assessed if we compare the evolution of those export figures with those for domestic consumption as seen in Fig. 7. If it was the increase in this latter variable that powered industry expansion during the first few years after entry into Europe, after 1992, it was exports that took the baton, reaching the level of domestic consumption in 2001. After that, the period of rapid export growth would come to an end, with subsequent years seeing alternating cycles of expansion and contraction, but always within levels above 100,000 tonnes and without fundamentally modifying either the dominant species or their European destinations.

6. The Common Fisheries Policy and the fish canning industry

All these dynamics of increased production and progressive orientation towards European partners would have been impossible had there

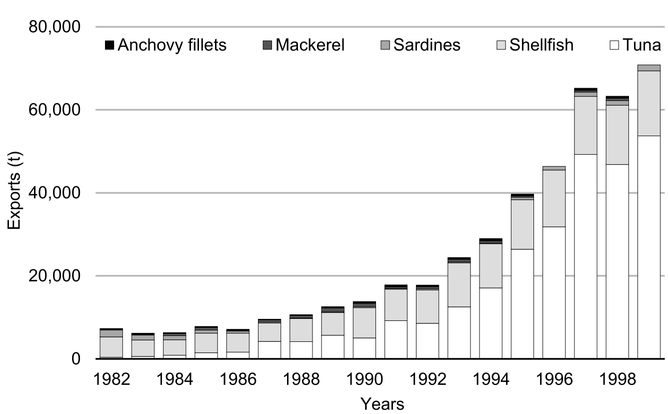

Fig. 5. Spanish exports of main groups of species to the EU during the period1982-1999.
Source. ECEE.

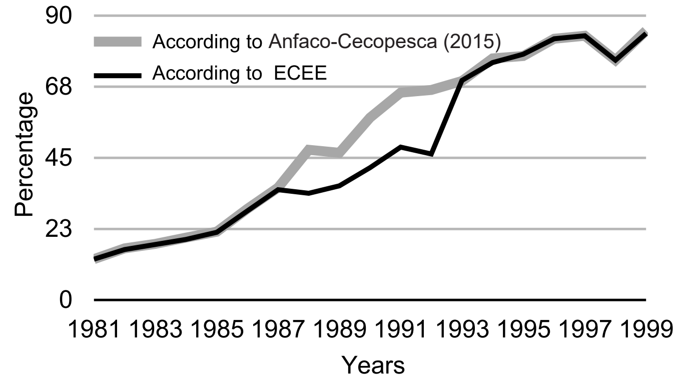

Fig. 6. Relative importance of exports to the UE with respect to the total, during the period 1981–1999.
Source:Dirección General de Aduanas, Anfaco-Cecopesca (2015)

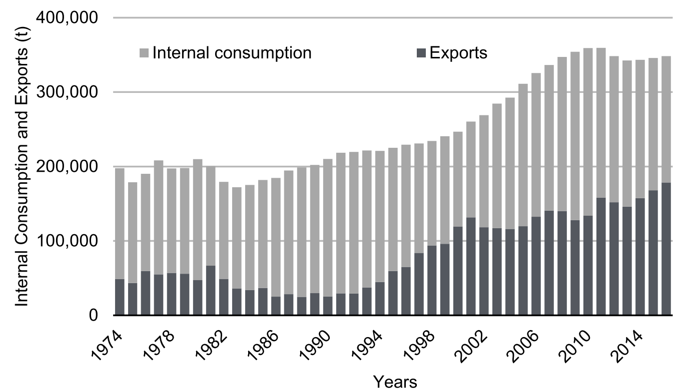

Fig. 7. Internal consumption and exports of Spanish fish preserves (1974–2016).
Source: Anfaco

not been a major restructuring and modernization of the sector. This process was also strongly supported by the revision of the Common Fisheries Policy, which practically coincided with the enactment of the 1986 Single European Act (Surís-Regueiro et al., 2003; González Laxe, 2008; Penas Lado, 2016). This reform grouped together in the so-called FIFG (Financial Instrument for Fisheries Guidance) several lines of assistance aimed at the restructuring and support of the fishing sector and the promotion of the development of coastal zones in which fishing was a key component of economic activity. Over the following six years many Spanish canning companies were to benefit from the co-financing of projects of the Operational Program FIFG 1994–1999 that destined important aid to the fishing and processing sector. These grants also benefited the so-called Objective 1 regions, defined as those regions that had a GNP per inhabitant of less than 75% of the European Community, such that Galicia, the main Spanish canning region by far, was able to qualify. The program, whose objective included in the area of assistance number six was "to improve the competitiveness of the European fish processing sector", consisted in aid of four different types of measures: increasing processing capacity, modernization of existing processing units (improving hygiene and environmental standards, quality and technological innovation), modernization of existing marketing establishments, and construction of new market establishments. The aid allocated to this four-fold objective represented 23% of the total budget of the Fund, approximately half of those aimed at the restructuring of the fishing fleet.

Eighty-one percent of the subsidies executed in area number six were concentrated in the first two aspects, those related to the processing industry, and within that, in the first of the measures indicated, the expansion of productive capacity (Penas Lado, 2016; Nautilus Consultants, 2003). The Spanish fish processing industry (hermetically preserved and frozen) received 173 million euros during the period of the first FIFG, of which approximately half went to the canneries (European Commission, 2001; Nautilus Consultants, 2003) .

In the following FIFG of 2000–2006, the subsidies to the processing sector were implemented basically through Measure 34 (processing and commercialization), which included two types of initiatives destined to that industry: 34.1 (increase in processing capacity) and 34.2 (modernization of existing processing units), and two others destined to commercialization. Of the 611 million euros allocated to the whole of Chapter 34, the first two initiatives received 482 million euros, of which 251 went to Spain, which was 52% of the total (Mare, 2010). In this second FIFG, the contribution of the Member States and the companies themselves to the projects was higher than that in the first FIFG, such that the European funds had a stimulus effect on investment that was much higher than in the first. For the set of four programmes included in Measure 34 (processing + commercialization), the FIFG contribution was 29% of total investment in the Objective 1 regions and 17% in the remainder. The public contribution by the Spanish administration raised the subsidy received by the companies to something more than 40% in the latter case, and to a figure close to 50% for those in Objective 1. Thus, in more than three quarters of the projects financed by the FIFG, the companies or institutions benefiting from these measures saw their investments financed by almost 50%. In this second FIFG, the assistance assigned to the frozen, salted and smoked industries increased in weight, while the one of the fish canning also continued to be very important. Between 1993 and 2006, the Spanish processing industry received close to 360 million euros from FIFG exclusively for the expansion and modernization of the canning sector, which is to say two of the four initiatives aimed at processing and commercialization. This figure agrees with that provided in its day by the Ministry of Environment, Rural and Marine's Directorate General of Fisheries Management (Gandarias, 2008).

With the FIFG programs, the canneries benefited not only from direct aid for the modernization of their own facilities, but also indirectly, given that many parts of their business ecosystem received subsidies that helped with their improvement and modernization, thus indirectly favouring them. This was the case in both of the other two initiatives from the same measure, in other sections of the Fund (Innovation, for example), and even with other Structural Funds. For example, the cold storage companies whose services were regularly used by the canneries and, in many cases, in which they were also partners, received a strong boost with the FIFG support. The same happened with culture and purification facilities for molluscs, especially mussels (Rodríguez et al., 2008), which constituted an important input for the processing industry, with port facilities, fish markets and/or their own business organizations within the sector. The most representative of them, Anfaco (National Association of Canned Manufacturers) received important support for the expansion of its technological centre (National Technological Centre for the Conservation of Fisheries Products-Cecopesca), both from the European Regional Development Fund as well as the Stride program. Almost at the same time, the regional government received support for the development of the Marine Environment Control Centre (now Intecmar), located in Vilanova de Arousa, mainly for the control of molluscs.

Overall, the 1993–2006 FIFG aid contributed according to the final evaluation of the second of its programs to improving sanitary and environmental conditions (cleanliness of food contact surfaces, waste management, ..), setting up production improvement systems (quality, technological innovations, ..), the transferring of plants, taken together, to the increase in production and the improvement of employment, as well as the adaptation of the Spanish sector to European community standards (Mare, 2010). The European Fisheries Fund, through Regulation 1198/2006 of July 27, 2006, would continue to support the processing industry in what Ernesto Penas, when referring to the canning and freezing industry, considers "one of the successes of the structural policy" (Penas Lado, 2016). Together, the two FIFGs provided important support so that the sector could make the internal adaptations necessitated by its new markets.

In this way, the CFP financial support to the fish processing industry would have had a positive effect on employment in one of the Objective 1 areas, highly dependent on fishing, such as Galicia, which accounts for more than 80% of the sector in Spain. It would also have had a positive effect on the hygienic and environmental improvement of the companies involved. On the negative side, some authors have suggested that subsidies to the fishing and processing sector, frequent in many fisheries around the world, would have had during the last decade of the 20th century and the first decade of the 21st century a negative effect, in general terms, on the sustainability of fishery resources (Milazzo, 1998; Sumaila et al., 2010; Sumaila et al., 2019c). This would also have been the case of the Common Fisheries Policy, although in this case in a more nuanced way and also with a progressive evolution from beginnings in which subsidies with "capacity-enhancing" effects dominated to later moments in which others that those authors categorize as "beneficial" are dominating (Skerrit et al., 2020; Cordón Lagares and García Ordaz, 2014). In general, these studies refer mainly to subsidies to the extractive sector, and much less to measures related to the downstream industry (Skerrit et al., 2020), although some of them also include the latter within the so-called "capacity-enhancing" subsidies and therefore as "harmful subsidies" (Milazzo, 1998; Skerrit et al., 2020).

We cannot enter here into a general discussion on the overall effects of the subsidies, but with regard to the FIFG aid to the Spanish canning industry, it is debatable whether it could have been seriously detrimental to the sustainability of the resource. Because, if the growing European demand had not been supplied by the Spanish industry, it would probably have been covered by that of other countries, such as Thailand, for example. These countries would have had to fish more, or buy more tuna on the international market. Thus, although it is possible that the Common Fisheries Policy, through subsidies, could at some point have been counterproductive to improving sustainability and may even have been "capacity enhancing" (Skerrit et al., 2020) it does not seem that the subsidies to the processing industry had this effect. The effect of downstream subsidies would not have been so much a contribution to overfishing, but, alongside tariff policy, rather a contribution to the industry relocation in the sense that Campling has suggested (Campling, 2016).

7. The acceleration of the business concentration process

The rapid adaptation process in the Spanish canning industry to EU frameworks had one of its most evident manifestations in the sector's own industrial organization. Over these years there was a strong concentration process that also incorporated a radical change in leadership in which relatively new companies moved in to displace traditional leaders, who, for the most part, went bankrupt or simply abandoned the sector.

To understand the industrial organization of the fish canning industry on the eve of accession to the European Union, it is necessary to go back to the decade of the 1940s, the years immediately following the Spanish Civil War. The extraordinary demand for preserves that had occurred during the war had caused the number of companies to multiply. Most of them, tiny in size, would have been condemned to disappear after the end of the conflict if, in 1941, the Franco regime hadn't established a system of quotas for raw materials that guaranteed all of them a minimum of olive oil supplies and tinplate (Carmona and Fernández-González, 2001). As the quotas were purchased at prices well below free market prices, they could be sold at a profit to other manufacturers, or even diverted to the black market. In circumstances of extreme scarcity such as those of the time, these quotas represented a differential rent that discouraged less competitive companies from leaving the industry.

For the sector as a whole, the consequences of that policy were devastating. In the 1940s, a supply of raw materials that did not surpass the pre-war period was distributed among a number of companies that had doubled since that time, provoking important capacity excesses that affected especially those companies that had more invested in fixed assets. The incentive to make investments, or to innovate, was practically nonexistent in this situation of international isolation, and scarcity and rationing of raw materials. The average size of the company diminished compared to the pre-war period, and the concentration levels did so as well. In Galicia, which in 1959 accounted for 57% of the Spanish production of the sector (INE, 1953), the turnover for the five largest companies represented 20.8% of the total, which is to say something less than half the figure of those reached in the years prior to the Civil War (Carmona and Fernández González, 2001).

State regulation began to ease with the economic liberalization of the late 1950s referred to in section 3. Companies realized that industries in other countries had changed drastically during the years they had been absent from foreign markets and that, if they wanted to return to them, they had to adapt to the new competitive environment. It was necessary to invest in two directions: on the one hand, in refrigeration capacity, in the mechanization of plants, and generally improving productivity and obtaining economies of scale; and, on the other hand, in the access to new sources for raw materials, as had already been done by the French in the late 1950s or the North American industry even earlier (Wolff, 1980; Mongruel et al., 2010; Smith, 2012; Campling, 2012). However, this opportunity was not attainable by all, in a sector that had been decapitalized during the 1939–1959 Francoist autarkic stage. Little by little, a long process of business closures began, accelerated by a few critical episodes of temporary nature (Carmona and Fernández-González, 2001).

All things considered, some companies demonstrated during the second half of the fifties that they were aware of the need to emancipate themselves both from the exclusive dependence on inshore fishing that presented diminishing returns and the extreme product diversification that prevented economies of scale from being achieved. And some of them realized that a feasible way to do that was introducing new species, such as the tropical tunas that both the Americans and French had already targeted in their industries. By the end of the 1950s, Canarian canning companies were the first to hire Basque fishermen to fish for yellowfin and skipjack in the Gulf of Guinea, and, very soon after, the Galicians, who represented the bulk of the sector, were to follow. By the beginning of the seventies those ships had turned into a fleet in which, alongside the vessels that employed the pole and line system, a modern fleet of freezer seiners had also emerged fishing in those waters and disembarking in Spanish ports, especially those in Galicia (Ferarios Lázaro, 2013; Ugalde Zabala and AuthorAnonymous, 2015; Carmona, 2017).

Some canning companies, such as Luis Calvo Sanz or Conservas Garavilla, decided to integrate vertically into tropical tuna fishing as a way to guarantee their supply and to escape the volatile fluctuations in price. Others decided to get involved in specialized companies in order to obtain a similar effect of reducing risk, as was the case of Jealsa. In the end, most of them established formulas for collective provisioning through sector organizations or simply by focusing on acquisition of tuna in the open market.

By 1984, on the eve of the signing of the Treaty of Accession to the European Community, three quarters of the companies existing in 1960 had already disappeared. The top five companies in the sector now accounted for 29% of the sector's turnover in a ranking whose top positions were still dominated by some of the historical names in the sector like Garavilla, Massó, Hijos de Angel Ojeda and Hijos de Carlos Albo. To that list, a relatively new company, Luis Calvo Sanz, was added (Fomento de la Producción, 1985; Carmona, 2011). When looking at the top ten, alongside several of the traditional companies was another company that could also be considered to be new, Jesús Alonso (Jealsa), which was already in 8th position.

On the eve of the implementation of the European Single Market, in 1992, the leadership group had experienced an almost complete reversal. Two of the top five, and three of the top ten, were immersed in crises that would soon culminate in their disappearances (Massó, Hijos de Angel Ojeda and Conservas Rocar). Calvo had reached second place just behind Garavilla, and Jesús Alonso was already third. The changes had especially affected the part of the sector that operated in the Canary Islands, which was very dependent on the sardine. 37% of the turnover was now concentrated in the top 5 companies in the sector, which is to say that concentration had increased by eight points between the 1986 Treaty of Accesion of Spain to the European Union and the 1993 Maastricht Treaty (Alimarket, 1993).

Rapid growth after Spanish integration into the Single Market would accelerate the concentration process, on the one hand by prompting new failures, the most notable being the bankruptcy of Bernardo Alfageme, and, on the other hand, through mergers as well as important entries into the sector. The first of the important mergers was that of two Basque canneries (Campos and Astorquiza) that, together with one of the main freezer purse seiner companies (Albacora), formed Sálica in 1990. The second was that of the Galicians Jesus Alonso and Escurís, which took place in 2001. The most important of the new entries was that of Frinsa, an important cold storage company that until then had been dedicated to the importing and marketing of tuna loins, who joined the group of hermetic canned producers in 1997. These five companies (Calvo, Garavilla, Jealsa, Frinsa and Sálica) accounted for 69% of the sector's turnover in 2016 (Alimarket, 2018).

At the beginning of 2016, thirty years after joining the European Union, the Spanish canning industry stood at the forefront of the sector in Europe. It had become an industry in which tuna accounted for the lion's share of the final product and that was integrated into global value chains backwards and forwards, importing and intervening in fishing in several oceans and exporting almost half of its production precisely to its European partners. Subsequently, however, important corporate weaknesses came to light when in 2016 and 2017 two companies from the top five, and the sixth as well, which is to say three of the top six, have seen major international operators enter their capital. In the case of Garavilla and Albo, with 100% they have taken over the entire capital, and in the case of Calvo with a very important, although not majority, stake.

8. Conclusions

After briefly reviewing the history of the fish canning industry in Spain, we analyzed the critical situation in which it found itself at the beginning of the 1980s, and how accession to the European Common Market was at that time the great hope for the sector. However, the conditions in which accession occurred, within a seven-year transitional period, disappointed many Spanish industrialists. Most of them were not able to take advantage of that period to improve their competitiveness, but a small group of them did.

During the transitional period, exports to Europe were held back by the overvaluation of the peseta and by tariff restrictions maintained on the Spanish fish canning industry. Nevertheless, that overvaluation, in combination with the disappearance of tariffs for capital goods, did allow some Spanish companies to import the machinery necessary to move the industry forward. After surviving the transitional period, this group of companies was then able to take advantage of the devaluations of the peseta in the early nineties, the tariff dismantlement of 1993, and the European financial support from 1994 to 2006 to modernize their factories and equipment and improve their overall competitiveness, in general. This allowed them to attain a strong position in the markets of their European partners, increase the scale of their production, and, in some cases, establish plants in Latin America. In this respect, the case of the Spanish canning industry confirms the importance that, to which Campling has referred, the tariff regimes of the last three decades had on the location of the fish processing industries (Campling, 2012, 2016). However, it also shows that this was not the only reason for the industry's success. The existence of a large internal market that acted as a buffer during the transitional period, the capacities built up during the sector's long history, and, above all, the existence of a modern tuna fleet more or less integrated, or vertically coordinated, alongside the processing sector, were, at minimum, equally important.

In this context, the expansion of the Spanish fish canning industry over the last forty years would have been unthinkable on the basis of national fish production prior to the 1960s, i.e. on the basis of sardine, anchovy or bonito fishing. The catches of all these species were already at the limit of their sustainable yields at that time, and, in fact, their poor evolution over the last fifty years confirms that supposition. A traditional canning country like Portugal, which shares the same sardine stock with Galicia, saw its industry fall radically because it remained linked to those resources.

Our work highlights the two-way relationship that has existed over the last fifty years between the extractive and processing sectors in the field of maritime industries. In the Spanish case, as in the French case, it was the canning industry that directly fueled the incorporation of new species and the expansion of fishing areas as a way to growth. Subsequently, the expansion of the tuna fleet itself led to it becoming autonomous from the processing industry, which, while continuing to supply the Spanish canning industry, also began to supply the international market.

It was thanks to this development of the Spanish tuna fleet that an industry that in the 1960s occupied a very secondary place in the international canning industry managed to overtake several of the former leaders and to position itself second only to Thailand, which had begun to grow as late as the 1980s.

In sum, the recent history of the Spanish fishing industry suggests that a successful and sustainable fishing industry is the result of policies and practices influenced by both the extractive and processing sectors. Resource management strategies therefore require the active participation of both, and always in a global context. While exclusively local or partial strategies in isolation may lead to changes in the location of the industry or fishing, they may not necessarily lead to sustainable management of fishery resources themselves.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

This work has been funded by FEDER/Ministerio de Ciencia, Innovación y Universidades–Agencia Estatal de Investigación/Research Project HAR2017-88128-R and by the Xunta de Galicia (Programa Consolidación Unidades Investigación Competitivas SUG 2019)

References

Adepoju, A., Salau, A., Obayelu, A., 2007. The effects of external debt management on sustainable economic growth and development: lessons from Nigeria. MPRA Paper 2147. https://mpra.ub.uni-muenchen.de/2147/1/MPRA_paper_2147.pdf.

Aixalá, J., 1996. La peseta en el Sistema Monetario Europeo. In: Velarde, García Delgado y Pedreño, España en la Unión Europea. Balance de un decenio. Civitas, Madrid.

Aixalá, J., 1999. La peseta y los precios. Un análisis de largo plazo (1868-1995). PUZ, Zaragoza.

Alimarket, 1993. Informe de Alimentación No Perecedera. Conservas de Pescado 1993. Alimarket.

Alimarket, 2018. Monográfico. Conservas de Pescado y Marisco 2017. Alimarket.

Anfaco-Cecopesca, 2015. O sector conserveiro de peixes e mariscos de Galicia. Evolución do seu impacto socioeconómico, internacionalización e innovación. Anfaco. Vigo.

Babatunde, S., 2013. Debt Crisis and Economic Underdevelopment in Nigeria: a Case Study of the Fourth Republic. https://www.academia.edu/3809341/.

Badinger, H., Nitsch, Volker (Eds.), 2019. Routledge Handbook of the Economics of European Integration. Routledge, London.

Baldwin, R.L., Wyplosz, Ch, 2020. The Economics of European Integration. McGraw-Hill, London.

Campling, L., 2012. The tuna "commodity frontier": business strategies and environment in the industrial tuna fisheries of the Western Indian ocean. Journal of Agrarian Change 12 (2–3), 252–278.

Campling, L., 2016. Trade politics and the global production of canned tuna. Mar. Policy. https://doi.org/10.1016/j.marpol.2016.02.006.

Carmona, X., 1985. La formaciòn de la industria conservera gallega. In: Papeles de Economìa Española, serie Economìa de las Comunidades Autònomas 3. Galicia.

Carmona, X., 1995. Recursos, organización y tecnología en el desarrollo de la industria española de conservas de pescado, 1900-1936. In: Nadal, J., Catalán, J. (Eds.), La cara oculta de la industrialización española. Alianza Editorial, Madrid.

Carmona, X. (Ed.), 2011. Las familias de la conserva. Anfaco-Cecopesca/Deputación de Pontevedra, Pontevedra. https://www.researchgate.net/publication/282327778_.

Carmona, X., 2017. Crisis, reconversión y concentración. La atunización de la industria española de conservas de pescado (1959-2007), paper presented at the XII Congreso de la Asociación Española de Historia Económica. Salamanca. https://www.aehe.es/wp-content/uploads/2016/01/CARMONA.pdf.

Carmona, X., Fernández-González, A., 2001. Demografía y estructura empresarial en la industria gallega de conservas de pescado del siglo XX. Ponencia presentada al VIi Congreso de la Asociación Española de Historia Económica, Zaragoza, AEHE.

Carmona, X, Nadal, J. El empeño industrial de Galicia. Fundación Barrié de la Maza. A coruña.

Carrera, P., Porteiro, C., 2003. Stock dynamic of the Iberian sardine and its implication on the fishery off Galicia. Scientia Marina 67 (S1), 245–258.

Cordón Lagares, E., García Ordaz, F., 2014. Fisheries structural policy in the European Union: a critical analysis of a subsidised sector. Ocean and Coastal Management 102, 200–211. https://doi.org/10.1016/j.ocecoaman.2014.10.001.

Cort, J.L., 2011. Pioneros del Índico, 1981-2011. IEO, Madrid.

D.G. Mare, 2010. Ex-post evaluation of the Financial Instrument for Fisheries Guidance (FIFG) 2000-2006. Final Report. D.G.Mare. https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/fifg_evaluation_final_report_en01.pdf.

Díaz de la Paz, A., 2012. Extracción de túnidos y competitividad en la industria derivada. El caso de las pesquerías canarias, 1950-1975. Anuario de Estudios Atlánticos 58, 487–514. https://mdc.ulpgc.es/cdm/singleitem/collection/aea/id/2228/rec/14.

Dirección General de Aduanas. Estadística del Comercio Exterior de España. Madrid. http://bibliotecacentral.meh.es/search/?searchtype=X&SORT=D&searcharg=Estad%C3%ADsticas+del+comercio+ exterior + de + españa.

Doldán, X.R., García-Negro, M.C., Chas, M.L., Villasante, y Sebastián, 2005. Las zonas dependientes de la pesca como factor generador de desigualdades territoriales en la política pesquera de la Unión Europea: análisis del caso en Galicia. Paper presented ata the XXXI Reunión de Estudios Regionales. https://www.researchgate.net/publication/.

Dubois, X., 2004. La Revolution sardinière: pêcheurs et conserveurs en Bretagne Sud au XIXe siècle. Presses Universitaires de Rennes, Rennes.

Escudero Domínguez, L.J., 2000. La industria transformadora de la pesca. Implantación, desarrollo y afianzamiento del sector en el País Vasco: 1841-1905. Itsas Memoria, 3. Revista de Estudios Marítimos del País Vasco.

Escudero Domínguez, L.J., 2007. Acciughe salate alla vera carne: Historia de los salazoneros italianos en Cantabria. Universidad de Cantabria, Santander.

European Commission, 2001. Green Paper: the Future of the Common Fisheries Policy: 2. Implementation of the Community System for Fisheries and Aquaculture over the Period 1993-2000. Office for Official Pub. of the European Communities, Luxembourg.

European Commission, 2000. Regional socio-economic studies on employment and the level of dependency on fishing. Final Report. https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/final_report_en.pdf.

FAO, 2007. Yearbook. Fishery Statistics. Capture Production 2005, 100/1. Fao, Rome.

Ferarios Lázaro, J.M., 2013. Campañas de Dakar. Las campañas de pesca de túnidos a caña realizadas por la flota de Bermeo en aguas de Africa Occidental (1956-1965). AZTI-Tecnalia. Bermeo, Pubmed.

Fernández-González, A., 2008. Cultivar ríos y mares: la acuicultura española en el siglo XX. Areas 27, 81–92.

Fernández-González, A., Giráldez, J., 2013. Acuicultura y globalización: el caso de la industria del mejillón, DT-1301. AEHE. https://www.aehe.es/wp-content/uploads/2015/04/dt-aehe-1301.pdf.

Fomento de la Producción, 1985. Las 2.000 Mayores Empresas Españolas, Barcelona. Fomento de la Producción.

Gandarias, J.I., 2008. Interview in Industria Conservera, 75.

Garavilla Legarra, J., 1984. La industria de conservas de pescado en España. Crédito Social Pesquero. V Semana de Estudios Pesqueros, Madrid.

García González, J.R., 1996. A industria conserveira: análise económica dunha industria estratéxica en Galicia, 4. IDEGA Working Papers, Santiago de Compostela.

García-del-Hoyo, J.J., Jiménez-Toribio, R., Guilloteau, P., 2017. A demand Analysis of the Spanish canned tuna market. Marine Policy 86, 127–133.

Giraldez, J., Garza, D., Varela, M., 2011. El sector pesquero. Un siglo de pesca en España. In: Robledo, R. (Ed.), Historia del Ministerio de Agricultura 1900-2006. Política Agraria y Pesquera en España. Ministerio de Medio Ambiente y Medio Rural y Marino. Madrid.

Gómez Navarro, M., 1981. Conservas de Pescado, 209. Economía Industrial.

González Laxe, F., 2008. Lecciones de Economía Pesquera. Netbiblo, A Coruña.

González Laxe, F., Macau, J., 1996. Fortalezas y debilidades de la Europa Azul.. Fundación Caixa Galicia, A Coruña.

Houpt, S., Ortiz-Villajos, J.M., 1998. Astilleros Españoles 1872-1998. Lid, Madrid.

INE (Instituto Nacional de Estadística), 1953. subs, . Industrias Derivadas de la Pesca 1953-1988. Madrid.

INE (Instituto Nacional de Estadística), 1983. Encuesta de Presupuestos Familiares 1980-1981, Madrid.

López Losa, E., 1997. Escabeche, salazón y conserva. Una primera aproximación a la transformación del pescado en el País Vasco (1795-1975). In: Las conservas de pescado en el País Vasco. Industria y Patrimonio. Untzi Museoa-Museo Naval, San Sebastián.
Marie D'Avigneu, A., 1958. L'industrie des conserves de poisson en France metropolitaine. Rennes.
Milazzo, M., 1998. Subsidies in World Fisheries: a Re-examination. World Bank, Washington DC.
Ministerio de Industria y Energía, Secretaría General Técnica, 1986. Informe Anual sobre la Industria Española.
Mongruel, R., Guillotreau, P., García del Hoyo, J.J., Jiménez Toribio, R., 2010. Turning fish into a brand: a century of rent-seeking strategies in the tuna canning industry. IIFET Montpellier Proceedings retrieved 18//7/2016.
Nautilus Consultants, 2003. FIFG Processing Study: Study on the Impact of FIFG Measures on the Fish Processing Industry. Summary Report. European Commission. https://ec.europa.eu/fisheries/sites/fisheries/files/docs/publications/fifg_report250204_en.pdf.
Ocampo Suárez-Valdés, J., 2006. Pesca y conservas de pescado en la economía marítima de Gijón, Puerto de Gijón. Pesca y Conserva. Autoridad Portuaria de Gijón, Gijón.
Penas Lado, E., 2016. The Common Fisheries Policy: the Quest for Sustainability. Wiley Blackwell, Oxford.
Ríos Jiménez, S., 1999. La industria conservera de Ayamonte: desde sus orígenes hasta la Segunda República. In: Parejo, A., Sánchez Picón, A. (Eds.), Economía andaluza e historia industrial, estudios en homenaje a Jordi Nadal. Málaga.
Ríos Jiménez, S., 2005. Origen y desarrollo de la industria de conservas de pescado en Andalucía (1879-1936), 29. Revista de Historia Industrial.
Rodríguez, G., Villasante, C.S., García Negro, M.C., Penela, A., 2008. As políticas públicas no desenvolvemento da miticultura en Galicia: o papel da Unión Europea. Revista Galega de Economía 17 (1).
Skerrit, D.J., Arthur, R., Ebrahim, N., Le Brenne, Le Manch, F., Schuhbauer, A., Villasante, S., Sumaila, U.R., 2020. A 20-year retrospective on the provision of fisheries subsidies in the European Union. ICES Journal of Marine Sciences. https://doi.org/10.1093/icesjms/fsaa142. https://www.researchgate.net/publication/344155628.
Smith, A.F., 2012. American Tuna. The Rise and Fall of an Improbable Food. University of California Press, Berkeley, Los Angeles and London.
Sumaila, U.R., Khan, A., Dyck, A., Watson, R., Munro, G., Tydemers, P., Pauly, D., 2010. A Bottom-up re-estimation of global fisheries subisidies. J. Bioeconomics 12, 201e225.
Sumaila, U.R., Villasante, S., Le Manach, F., 2019c. Fisheries sub- sidies wreck ecosystems, don't bring them back. Nature 571, 36–36.
Surís-Regueiro, J.C., Varela, M., Garza, M.D., 2003. Effectiveness of the structural fisheries policy in the European Union. Mar. Pol. 27.
Ugalde Zabala, R., 2015. Atuneros congeladores vascos. Un sector de relevancia económica mundial. Ediciones Beta III Milenio. S.L., Bilbao.
Valdaliso, J.M., 2018. Moving up in the league with a little help from the state: the Spanish shipbuilding industry during the developmental Francoist regime. Int. Jl. Of Maritime Hist. 30 (3), 488–507.
Vázquez, G., et al., 1996. El sector pesquero español en la Unión Europea. Fundación Alfonso Martín Escudero, Madrid.
Vieites, J.M., 1998. La sardina en España: situación actual y perspectivas futuras de la transformación y comercialización. Conferencia Mundial de la Sardina. Anfaco-Cecopesca. Vigo.
Villasante, et al., 2015. Estimates of Total Fisheries Removals from the North West of Spain (1950-2010. https://www.researchgate.net/publication/286018782_Estimates_of_total_fisheries_removals_from_the_Northwest_of_Spain_1950-2010.
Viñals, J., 2004. La economía española en la Unión Europea. Papeles de Economía Española 100 (1).
Wolff, Th, 1980. In Pursuit of Tuna: the Expansion of a Fishing Industry and its International Ramifications- the End of an Era. Arizona State University, Tempe.
Wyatt, T., Porteiro, y C., 2002. Iberian sardine fisheries: trends and crisis. In: Sherman, K., Skjodal, H.R. (Eds.), Large Marine Ecosystems of the North Atlantic. Changing States and Sustainability. Elsevier, Amsterdam.