

Agricultural Exports and Economic Development in Spain during the First Wave of Globalisation

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Abstract: The objective of this article is to study the evolution of Spanish agricultural exports, their share of agricultural production as a whole, the determinants of their expansion and, finally, the contribution that they have made to economic development. Our results show considerable dynamism in agricultural exports, which however faced certain obstacles that limited any further expansion. Their share on production varied greatly, but for some relevant products it was fundamental, substantially contributing to its growth. The increase in external demand but also the comparatively high profitability of export products and a high level of competitiveness in the international market generated highly dynamic behaviour in supply. The contribution of the export sector to Spanish economic growth was positive although moderate. It contributed to financing necessary imports during the industrialisation process, favoured a more efficient allocation of resources and produced intersectoral linkages. However, the geographical concentration of production for export limited its spatial impact on the Spanish economy.

Keywords: Agricultural Development, Agricultural Trade, Spanish Economic History, Globalisation

JEL CODES: N53, N73, O13, Q17

Acknowledgments: The authors wish to thank the editor of this issue, three anonymous referees, Pablo Castro, Domingo Gallego, Alfonso Herranz, Ramon Ramon and participants at the Rural History Conferences (Bern, 2013 and Paris, 2019) for their comments and help.

Funding: This study has received financial support from the Ministry of Science, Innovation and Universities of Spain, project PGC2018-095529-B-I00 and from the Government of Aragon, through the Research Groups, S40_20R and S55_20R and FEDER.

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1. Introduction

The role played by agriculture in Spain's economic development constituted a central issue in the debate among economic historians in the 1970s and 1980s ¹. The view of a backward economy in which the industrial revolution had failed consolidated quickly. Agriculture was considered to have played a determining role in this failure because, as a market, it had not been able to stimulate industrialisation due to its low technological development and the passive nature of the farmers who had no interest in innovation and who were unreceptive to market signals (Nadal, 1975). In short, as the majority of the population and the economic activity were linked to the agricultural sector, its low level of demand was responsible for the economic backwardness of the country.

The absence of sufficiently solid empirical data to verify this hypothesis gave rise to intense efforts to quantitatively estimate agricultural production from the end of the nineteenth century, which is for when the earliest data could be obtained, until the Spanish Civil War of 1936-1939 (Grupo de Estudios de Historia Rural, 1983 & 1991; Simpson, 1995). The new available data showed an increase in production and productivity which was at odds with the image of stagnation that had prevailed until then. On the contrary, particularly in the first third of the twentieth century, a rapid advance in production and productivity could be detected which compared favourably with other European agricultural sectors (Grupo de Estudios de Historia Rural, 1983, Jiménez Blanco, 1986). Other studies have also reviewed the events of the nineteenth century, appreciating a significant growth of total factor productivity (Bringas, 2000; Lana, 2011). The new view of the contribution of agriculture to economic development indicates environmental constraints, particularly the aridity and roughness of the terrain, trade restrictions on further increases in agricultural exports and the low labour productivity as limiting factors but not decisive obstacles to economic growth (Gallego, 2001). Great emphasis has also been placed on the low level of development of industry and its low capacity to draw the active rural population towards the towns as a key element that limited the improvement of agricultural productivity. Some economic historians have particularly highlighted the

¹ On the debate, see Iriarte & Pinilla (2019).

low dynamism of the industrial sector and its excessive orientation towards the domestic market as key factors for understanding the difficulties to increase the exodus of the rural workforce which would have stimulated a faster technological change and the consequent growth in productivity (Prados de la Escosura, 1988; Silvestre, 2005).

Certain institutional obstacles also limited agricultural progress, such as the unequal distribution of property or the very low development of the financial system that was unable to provide the necessary agricultural finance at a reasonable cost (Clar & Pinilla, 2009).

In short, in view of the extensive European revisionist literature (Lains & Pinilla, 2009), the perception of the role of agriculture in economic development has shifted towards a view that considers that although the agriculture sector was not able to lead the development process it was not responsible for Spain's backwardness. This shows that the modernisation of the Spanish economy advanced until the years of the Civil War, although at a slow rate.

Within this context, the export sector is particularly noteworthy for being the most dynamic within Spanish agriculture (Pinilla, 2001). The exports of food and agricultural products grew substantially during the first wave of globalisation and were particularly important for the international integration of the Spanish economy (Prados de la Escosura, 1982; Gallego & Pinilla, 1996). Therefore, the objective of this article is to study the evolution of Spanish agricultural exports, their weight on the agricultural production as a whole, the determinants of their expansion and, finally, the contribution that they made to economic development².

Our results show an important dynamism of agricultural exports, which however faced certain obstacles that limited any further expansion. Although their share on production as a whole was not too big, for some relevant products it was essential, substantially contributing to growth. The increase in external demand but also the comparatively high profitability of the export products and a high level of competitiveness on the international market generated a highly dynamic behaviour of supply. The contribution to economic development, while substantial, particularly

² In this article we consider agricultural products (crop and animal production), and processed agrifood products (oil, wine, vegetable preserves....)

through the obtaining of currencies and the dynamism of certain activities with relevant carry-over effects, was limited due to its moderate share of agricultural production.

After this introduction, the article begins by studying the evolution of exports and their composition. Subsequently, it quantifies their importance in the expansion of output. The following section analyses the principal determinants of export growth. In the fifth section we study the principal economic impacts of agricultural exports and in the final section we draw the main conclusions.

2. The evolution and composition of exports of food and agricultural products

Exports of Spanish food and agricultural products grew in the period of the first globalisation at an average annual rate of 2.5%³. However, as we can see in Graph 1, the growth rate was significantly higher in the second half of the nineteenth century, particularly from approximately 1870 until 1891, than later. 1891 was a significant year because, as we shall see later, from this year, wine exports to France, which had accounted for much of the strong growth in this first sub-period, began to suffer from strong protectionist measures in the French market, so exports as a whole fell sharply. Therefore, the growth in the years 1849-1891 was notably higher than that of the period 1891-1928; with an average annual rate of 3.6% as opposed to 1.2%.

[Figure 1 near here]

The deceleration of the growth rate of Spanish agricultural exports fully coincided with that of the international trade. The average annual growth rate of global agricultural exports between 1850 and 1902 was 3.7% (almost identical to the Spanish rate) while between 1902 and 1938 it only reached 1.4% (Aparicio, González, Pinilla & Serrano, 2018). From 1929, Spanish exports shrank significantly as a consequence of the economic crisis and the measures taken by many countries to restrict trade (Hynes, Jacks & O'Rourke, 2012, Bromhead, Fernihough, Lampe & O'Rourke, 2019; Hernández & Pinilla, 2013).

³ For this calculation we have considered the period 1849 (first year for which there are data available in the Spanish foreign trade statistics) until 1928 (historical maximum of Spanish agricultural exports before the collapse of **trade** from 1929). We have chosen 1891 to divide the period into two as this is the year when a new tariff law gave rise to a clear shift towards protectionism.

A wide variety of products fuelled the expansion of exports, although there was an important change in the composition of the most prominent products in the two sub-periods that we have described. Wine was the leading product in the period between 1849 and 1891, when it represented more than half of food and agricultural exports (Table 1). Nuts and raisins and olive oil were the next most exported products during this period. Growing French demand was the main basis for the expansion of wine exports, particularly when the arrival of the phylloxera plague to France caused its production to fall drastically. The supply of the domestic market and the maintenance of its exports required France to import a high volume of wine and Spain became its principal supplier (Lachiver, 1988; Pan-Montojo, 1994; Chevet, Fernández; Giraud-Héraud & Pinilla, 2018).

[Table 1 near here]

The recovery of production in France, after it had replanted its vineyards with American vines immune to the plague, did not imply a sharp fall in imports in the short term, as the hybrids initially used in this replanting produced wine with a pale colour and a low alcohol content, so it was necessary to mix it with wines with a higher alcohol content and a more intense colour, such as those from Spain. However, the development of the French colonisation in Algeria and the rapid expansion of wine-growing by colonists from the mother country, led to a customs policy that punished the imports from third countries, especially Spain which was its principal supplier, and allowed Algerian wine to enter France practically free of duties, which quickly replaced Spanish wine (Pinilla & Ayuda, 2002). The colonisation policy played a crucial role in this expansion of wine production (Maravall, 2019). Spanish wine found itself in a very vulnerable position and its sales to France varied wildly depending on the French harvest and that of its North African colony. But Spanish wine also faced considerable problems in other markets into which it had expanded. In the American continent, the protectionist measures to promote domestic production, both in the United States and in other countries such as Argentina or Uruguay, led to a strong fall in Spanish exports. In the markets of the industrialised countries with higher income levels, exports were enormously limited as wine had not become a mass consumer product due to a preference by their populations for other alcoholic drinks such as beer or spirits (Anderson, Nelgen & Pinilla, 2017; Anderson, Meloni, & Swinnen, 2018). These difficulties for wine in external markets are

fundamental for explaining the lower growth rate of agricultural exports in the first third of the twentieth century, given the enormous share that this product had of them.

From the last decade of the nineteenth century, fresh fruit and vegetables (Mediterranean Horticultural Products, hereafter MHPs) were the products that led export growth. From representing a very small percentage of exports in the mid-nineteenth century, they grew to almost 40% of them. Wine was a very traditional export product in Spain and highly adapted to the country's agro-climatic conditions as grapes are a dry crop. Fresh fruit and vegetables, on the other hand, require abundant sunlight, which Spain has plenty of and a lot of water, which was not feasible in a semi-arid country. Therefore, different irrigation works had to be undertaken in order to supply these crops with water. In this case, the principal markets for these exports were the northern European countries, in which the increase in income translated into a greater than proportional increase in the demand for these products⁴. Another product whose exports also rose slightly was olive oil. In this case, despite the problems encountered at the end of the nineteenth century due to the competition from synthetic oils for industrial uses, from 1914, new refining technology enabled a strong expansion of its exports in the first third of the twentieth century. As in the case of wine, in this case, the principal client was also a large producer, Italy, which subsequently often re-exported it after re-bottling it.

In the three most important product groups in terms of exporting expansion, Spain reached a significant share of global trade, despite the enormously competitive markets (Table 2). Both in MHPs and olive oil, this share oscillated at around 33% of world trade, which shows a very solid position. In the case of wine, the share varied quite a lot, but normally oscillated between 20% and 50%.

[Table 2 near here]

3. How much did agricultural exports contribute to output growth?

It is important to know the extent to which the exporting expansion was relevant for the growth of Spanish agricultural production. Therefore, first we have estimated the ratio of exports to production for the years 1860, 1900 and 1930 (Table 3). The calculation is made at fixed 1910 prices for exports and for production. The table shows that, for all of

⁴ It has been estimated that the elasticity of demand for oranges (the most important of the exported MHPs) with respect to income was 3.05 for the period 1854-1896 and 1.44 for the years 1896-1935 (Pinilla & Ayuda, 2008, p. 588).

the years studied, the exported amounts represented extremely varied percentages of production of the different products⁵.

[Table 3 near here]

We can observe highly significant differences between the most important products in exports and the rest. Therefore, the very high share of production that exports represented of wine, MHPs or olive oil contrast with the very low weight of the main product of Spanish agriculture: cereals. The same occurred with livestock production, in which exports also accounted for a very low percentage of production. It should be taken into account that cereals and livestock products were very important as in 1900 they represented 32% and 27% of final agricultural production, respectively (Simpson, 1994). In short, Spain was not a competitive producer of cereals or livestock products given its agro-climatic characteristics, and its production per hectare was very low (González de Molina, 2001).

We can further our understanding of the contribution of the export growth to the increase in production if we estimate what part of the latter was due to the increase in exports. For the agricultural sector as a whole, this contribution was modest, as we can place it at around 11%; a little more for the second half of the nineteenth century and less for the first third of the twentieth century. Furthermore, if we break down the estimate by groups of products (for those for which it is possible), the contrasts are enormous (Table 4). In the principal export products, this contribution was fundamental, particularly in the case of the MHPs, but it was also significant for olive oil and wine. However, for other products it was much less significant.

[Table 4 near here]

4. The major determinants of export growth

We can classify the factors that fuelled the growth of Spanish agricultural exports into three groups: demand, supply and those linked to the globalisation process itself. As we shall see below, for the three product groups that accounted for the greatest share in the increase of exports (wine, olive oil and MHPs), the weight of these factors often did

⁵ The ratio of agricultural imports to production was similar, although slightly lower (Pinilla, 1995: 166; Gallego, 2001: 156)

not coincide having certain significant differences, although there were also certain similarities.

From the demand perspective, the increase in the income of those countries where it was growing the most due to the development of the industrialisation process is, undoubtedly, the first factor to consider. This improvement in income clearly boosted the exports of MHPs. For the period 1870-1935 each increase of 1% of global income implied an increase in Spanish exports of MHPs of around 1.3% (Pinilla & Ayuda, 2010).

However, wine displayed very different dynamics. Although the increase in the populations of the importing countries benefited Spanish exports, the improvement in their income per capita did not (Pinilla & Serrano, 2008). Spanish exports were directed at highly varied markets. In some of them, the increase in the population, where wine was the most important alcoholic drink, facilitated the expansion of exports, but when the majority of the population preferred other alcoholic drinks, the improvement in income per capita did not imply a sustained increase in exports in the long term⁶. This occurred in the British or North American markets, where only the small economic elite class consumed wine and this was as a luxury product. Only the immigrant population with Mediterranean origin constituted a significant consumer of wine in the United States. In these types of markets, population growth did not lead to an increase in exports.

The case of olive oil is similar to that of wine, as, its market was limited to the Mediterranean area and immigrants from this region in other countries, such as the United States. Therefore, it did not become a product of mass consumption which enormously limited its export growth.

From the demand perspective, another two factors were important to explain the export growth. First, as we have already indicated, transatlantic emigration opened up possibilities in the north and south of the American market in order to increase exports. Emigrants conserved the consumption habits of their countries of origin and therefore fostered the increase in exports (Dunlevi & Hutchinson, 1999; Ramon-Muñoz, 2010). In the case of Spain, this was particularly important in the region of the River Plate (Fernández, 2004). Finally, an external and unexpected shock, namely the phylloxera

⁶ Similarly, French wine exports between 1849 and 1938 were not driven by growth in the income per capita of their trading partners (Ayuda, Ferrer-Pérez & Pinilla, 2019).

plague to France and the brutal fall in its production, generated a rapid increase in Spanish wine exports to France (Chevet et al., 2018; Lachiver, 2009).

From the supply side, it is important to note how certain technological innovations favoured the improvement of exporting possibilities and foreign sales. In the case of the MHPs, the most notable was the change in cultivation methods. In the case of fruit trees, the crops changed from trees being planted on the edges of the fields, normally where cereals were grown, so as to complement the basic production of cereals and small vegetable gardens for self-consumption to uniform and specialised plantations of trees and plants for the purpose of selling the produce either in the domestic market or abroad (Garrahou, 1985). At first the traditional irrigation systems could be used, but soon it was necessary to construct new installations to ensure the supply of water (either through well drilling or the construction of canals), the use of fertilizers (first guano and then chemical fertilizers) and the use of machinery to pump water. We can appreciate the size of this transformation process if we take into account that in the two principal orange producing provinces, Castellon and Valencia, the area dedicated to their cultivation grew from 1,249 hectares in 1860 (only ten years after the regular plantations of oranges came into being) to 58,773 in 1932. Furthermore, the demand for the supply of water required irrigation or well drilling works to be carried out together with the increasing use of machinery and fossil energy sources to pump water (Calatayud & Martínez Carrión, 1999 & 2005). This represented very important changes in soil uses, as the predominant irrigated crops were cereals.

The expansion of exports required an increase in production, which, as we have seen, was significantly driven by the exports in the most relevant products in foreign trade. This increase in production largely took place as a result of the increase in prices of exportable products, with respect to those intended for the domestic market.

In short, farmers increased production by planting vines on land previously used for cereals or on unfarmed land in the case of wine, or for MHPs, investing in new irrigation works, drilling wells or replacing traditional cereal crops, because it was much more profitable. During the great wine growing expansion in the final decades of the nineteenth century, wine prices grew quickly due to French demand. In the case of MHPs, the high elasticity of supply with respect to relative profitability (2.57) clearly shows the importance of changes in this variable for the evolution of supply (Pinilla & Ayuda, 2010). In short, there were high returns compared with those offered by traditional

products. Roncalés showed that in 1881, the return per hectare in the Valencia orange groves was 248 per cent higher than the all-crop average in 1881, and approximately 200 per cent higher than the return on any other irrigation-based product (Roncalés, 1998, pp. 186-197). Other studies have also verified the high returns of the orange crop (Garrido, 2010; Palafox, 1983). The real prices of MHPs as a whole behaved favourably between 1870 and 1935 (Pinilla & Ayuda, 2010).

The more dynamic growth of exports cannot be explained if we do not contemplate Spain's high level of competitiveness, which ensured it a high market share in these products (Table 2). As already seen, this occurred in the case of wine, not only during the exporting expansion phase, but also in the first third of the twentieth century, when Spanish exports grew more than world exports thanks to their high competitiveness (Pinilla & Ayuda, 2002, pp. 77-78; Tena, 1992, pp. 348-349). The same was the case of olive oil, whose exports were also driven by the competitiveness effect (Tena, 1992 p. 349), particularly with respect to the other great world producer, namely Italy, which imported increasing amounts of Spanish oil (Simpson, 1995). Spanish exports in 1870-74 represented just 37% of Italian exports, but in 1934-38 they represented 147% (Ramon-Muñoz, 2000, p. 170). In the case of oranges, we also have evidence that their price on the international market gave them an advantage with respect to technologically more advanced competitors such as California (Pinilla & Ayuda, 2009; Garrido, 2010). Therefore, in 1934 the price of Spanish oranges entering the British market before paying tariffs was approximately 60% of that of the oranges coming from California or Brazil and 78% of those from Palestine (Neumark, 1938, p. 113)⁷. The lower labour costs constituted one of the main sources of Spain's competitive advantage for both the MHPs competing with those of California and for wine, competing with that of France. Also, in the canning sector, specifically in vegetable preserves, the low prices and high quality of Spanish products explain their extraordinary growth in the first third of the twentieth century (Martínez Carrión, 1989, p. 644).

⁷ The lower price could also reflect a lower quality of Spanish oranges, understood principally as a lack of standardisation, insufficient maturing or the sale of frost-damaged fruit. These quality problems in external markets only arose in the mid 1920s as a consequence of the dramatic increase in exports and the favourable commercial opportunities (Font de Mora, 1938: 301-2). Tena (1992) finds a slightly negative effect of the competitiveness of Spanish oranges between 1913 and 1928, due to a reduction in their relative prices on the international market. This would reflect that the huge growth in external demand not only translated into an increase in output but also in prices.

The expansion of exports also faced obstacles from the supply side which limited their growth. The most noteworthy obstacle was the quality of the products in which Spanish agricultural exports specialised and their marketing; two very closely related aspects. A common pattern shared by the principal export products was a specialisation in the medium or low quality segment. Other European countries, such as France, opted to specialise in high quality products, while those of the eastern or southern Mediterranean concentrated on lower qualities. This trend can be observed in the three principal export products. Therefore, in wine, while France specialised in high-quality bottled wines, Spain focused mainly on ordinary wine with some weight in the higher-quality products such as sherry and Algeria exclusively specialised in ordinary wines with which to make coupages (Ayuda et al., 2019 & 2020; Simpson, 2011, Fernández & Pinilla, 2018). Therefore, if we consider the foreign sales of the four leading exporters, which represented between 75% and 85% of world exports in terms of volume during the first globalisation, Spain never represented more than 20% of the exported high-quality wine, except during the golden years of sherry exports between 1850 and 1880. However, in low quality wine exports, Spain represented over 50%, although the Algerian competition ended up reducing this share considerably. From 1880, the higher quality bottled wines never accounted for more than 30% of Spanish wine exports and in most years this percentage was much lower. Spain also specialised in the medium and low segment of olive oil, with a predominance of bulk sales. Finally, in the case of the MHPs, the technological gap with Californian produce (and in the 1930s with that of Palestine) was significant.

Large differences can also be observed in the marketing of the products: bottled French wine or Italian oil as opposed to Spanish bulk sales; accredited brands with higher prices as opposed to Spanish products that stood out for their low prices; new varieties of standardised and well-classified Californian oranges as opposed to the Spanish oranges with many different varieties and calibres and with a variety of qualities; Californian seedless raisins as opposed to the traditional Spanish varieties (Morilla, Olmstead & Rhode, 1999; Pinilla & Ayuda, 2009; Garrido, 2010). The organisation of the marketing of the products played a decisive role. The Californian orange producers were highly organised in creating accredited brands, while in Spain the marketing was a considerably fragmented. The Californian producers were even able to shift the demand curves by introducing new products such as raisin bread or orange juice into consumption habits. In

short, production specialisations and the marketing reflected different production factor endowments and very different relative and technological costs. Capital was expensive and labour was cheap in Spain compared to France or California, but not with respect to the Maghreb or Eastern Europe. Therefore, if specialisation responded to the comparative advantage of each area, it is important to take into account how much this affected export growth and its impact on economic growth.

Due to their specialisation, Spanish wine exports were highly sensitive to the trade policy of some of their most important markets and they had serious difficulties to retain markets, such as the case of sherry in Great Britain, due to the doubts arising in terms of the maintenance of the quality of the product (Simpson, 2004; Fernández, 2010). It did not manage to reach the highest market niches, which required considerable investments in advertising and quality assurance. With difficulties in the high-quality segment and a decreasing and irregular demand in the low-quality segment, the behaviour of wine exports was precarious in the first third of the twentieth century.

Ramon-Muñoz (2020) finds that the world trade of packaged olive oil, used as a proxy for branded olive oil, increased more rapidly than total world olive oil trade from the 1870s onwards. Spain's share of this market was comparatively much lower than that of Italy (Ramon-Muñoz, 2010a). As markets matured entry barriers, coming from product differentiation through packaging, branding and advertising, became more important for new entrants. This might help to explain the difficulties of Spain's firms compared to the Italians that arrived much earlier, in markets such as the American one, for packaged and branded olive oil (Ramon-Muñoz, 2010b).

In the case of the MHPs, while demand expanded quickly, in general, there were no major problems for Spanish exporters, with the noteworthy exception of the sale of raisins in foreign markets, which succumbed to the competition of Californian raisins (Morilla et al., 1999). But from the mid-1920s onwards there was a deterioration in the quality of Spanish oranges as a consequence of exporting consignments containing a high percentage of fruits that had been blighted by frost and insufficient maturing of them. Taking advantage also of the poor harvests of the 1930s, it was Palestine that began to compete strongly with Spain in the British market (Instituto Valenciano de Economía, 1951; Pinilla & Ayuda, 2009). Palestine's production, which had been growing extremely rapidly since the 1920s thanks to the impulse provided by Jewish colonists and the availability of an impressive flow of external capital from the same source, had also

benefited from its superior quality, thanks to better climatic conditions and the adoption of modern Californian techniques, (Metzer, 198 and 2000; Karlinsky, 2005). In general, a greater concern for quantity rather than quality can be observed, as the first specialisation was more profitable for the Spanish producers in the short term (Garrido, 2010).

Finally, the drivers of the first globalisation, trade liberalisation and the reduction in transaction costs favoured, at least initially, the expansion of Spanish exports.

The reduction in transport costs favoured the cheapening of Spanish products in foreign markets. It has been economically verified that this reduction in transport costs fuelled both the supply and demand of MHPs between 1870 and 1935, although its effect was small given the proximity of the principal destination, which was Great Britain (Pinilla & Ayuda, 2010). In the case of Spanish wine, the sensitivity of exports to transport costs has also been verified (Pinilla & Serrano, 2008). French demand even drove the construction of small railway spurs in Spain that connected the producing areas with the main lines enabling the wines to be transported to France. There is also empirical evidence of the positive impact that the reduction of the fleets had on France's and world wine exports (Ayuda et al., 2019 & 2020).

The role played by international trade liberalisation, principally through the signing of bilateral agreements, was ambivalent. Initially, it clearly favoured Spanish exports of agricultural and food products, but progressively in some important markets, the protectionist wave, initiated at the end of the nineteenth century, negatively affected these exports.

We can clearly see this double role played by tariffs in wine exports. Without a very substantial reduction of the tariffs paid by Spanish wine in the French market, the great exporting expansion beginning in the 1850s would not have taken place, but particularly from the end of the 1870s (Pan-Montojo, 1994). The Italian case shows how the trade war with France, at the critical time of intense demand for wine in the latter due to the phylloxera plague, enormously limited the ability to take advantage of such a relevant circumstance (Loubère, 1978). However, from the end of the century, a radical change in French trade policy with respect to wine to favour the production of its colony Algeria, greatly limited the imports coming from Spain which became enormously irregular as, in the short term, they depended essentially on France's volume of production. Therefore, in France between 1874 and 1934, each one per cent increase in

the tariff would reduce the market share of imports by around 1.8% in the long-term (Pinilla & Ayuda, 2002, pp. 69-75). But Spanish wine also suffered the consequences of the increase in protectionism in the American continent. Countries such as Argentina, Uruguay, Brazil or the United States significantly increased production from the end of the century, which had an important effect on European imports, such as those from Spain (Anderson & Pinilla, 2018; Ayuda et al., 2020). The state implemented an active policy to sign trade agreements that facilitated the entry of Spanish agricultural products in the markets of other countries, although at the cost of facilitating the entrance into Spain of manufactured goods from more industrialised nations (Serrano, 1987). It could be said that this was the main contribution of state action to the expansion of exports.

The tariff problems also clearly affected the MHPs, although mainly in the North American market. The boom in Californian production and the will of the Congress to reserve the domestic market for it, severely harmed Spain's exports of these products. Therefore, the Spanish producers not only gradually lost the opportunity to expand their sales in a market with a more dynamic behaviour but these sales fell significantly. In citrus fruits alone for the year 1910, Spain's GDP would have increased by 0.8% in the case where protection did not exist in the United States market, due to the increase in the exports (Pinilla & Ayuda, 2009, pp. 193-194). The case of protection of citrus fruits was not an exception. From 1924, the market also shut out table grape imports due to supposed health reasons, although the protectionist measures really sought to protect the thriving Californian industry (Sánchez, 1992). However, in the United Kingdom, the principal market of Spanish MHPs, an open market without restrictions, Spanish exporters, maintained and increased their sales until the depression of the 1930s.

For olive oil, after liberalisation, the northern European markets maintained a low level of protection throughout the period, so their tariffs were not an obstacle for export expansion, rather a favourable element. However, in the American continent, the levels of protection were high, particularly from the end of the nineteenth century. In Latin America, depending on the years and countries, they oscillated between 30-50% ad valorem and in the United States at around 35% until the 1930s when they reached values of around 70%. Contrary to the case of wine, the protection of this continent was mainly due to fiscal factors, that is, revenue needs of the governments, although in the United States, the pressure of the Californian producers may also have been significant (Ramon-Muñoz, 2010a, pp. 172-178).

5. The main economic impacts of export growth

During the period of study, the agricultural sector was the most important of the Spanish economy, oscillating between a maximum of approximately 40% of GDP between 1850 and 1880 and a minimum of approximately 25% in the 1930s (Prados de la Escosura, 2003, pp. 290-292). With the estimates that we have carried out of the weight that exports represented of the whole of agricultural production (Table 3), we can observe that their contribution to economic growth was positive, although moderate. However, the economic impact should take into account the variations in relative prices and, as we have indicated, those of the export products tended to behave in a better way than those of agricultural production as a whole. Therefore, if we take the data of Gallego (2001) referring to production at current values and calculate the ratio between total agricultural exports and final agricultural production, their impact was significant, although highly variable due to price fluctuations. Exports represented between 10% and 20% of final agricultural production (Figure 2).

[Figure 2 near here]

Throughout the period studied, agricultural exports constituted around 70% of the total exports, in other words, they were decisive for the Spanish foreign trade sector. One of their key contributions was their fundamental role to even out the balance of trade. The agricultural balance of trade had an almost permanent positive sign, except in certain adverse circumstances, and therefore facilitated the financing of the import of certain crucial goods during the Spanish industrialisation process (Gallego & Pinilla, 1996). This positive sign of the agricultural balance of trade was due mostly to fruit and vegetable production and the derived processed products. The imports of livestock products however, significantly exceeded exports (Table 6).

[Table 5 near here]

[Table 6 near here]

As we have seen, exports were concentrated in a series of products and played a fundamental role for the expansion of the production of these products. In spite of this, however, the diversification of the exported products was noteworthy (Table 1). In these cases, there were also certain significant linkages with other economic activities.

On the one hand there were some significant backward linkages. They favoured the modernisation of agriculture, driving technological change, such as the use of inorganic fertilizers for MHPs, the use of chemicals to fight against vine plagues or the rapid implementation of vineyard reconstitution methods after the arrival of the phylloxera plague. Furthermore, they also fostered the formation of fixed capital with irrigation, the fuelling of the chemical fertilizer industry, the manufacture of containers, the improvement of port infrastructures for MHPs or railways in the vineyards and MHP farms (Calatayud, 2011).

The case of fertilizers is particularly interesting. In the area most specialised in export-oriented agriculture, which was Valencia, the fertilizer manufacturing industry developed considerably. They were first introduced and their use was most prominent along the Mediterranean coast in the provinces of Valencia and Tarragona (Calatayud, 2011; Pujol, 1998). In general, the development of this industry also favoured the industry supplying production assets for agricultural exports. Therefore, in the chemical industry, besides the manufacture of fertilizers, the production of gunpowder and other explosive materials for well drilling prospered, as did the refinery of mineral oils or petrol for water extraction pumps for irrigation. On the other hand, another key industrial sector, namely that of steel constructions, also expanded thanks to the production of waterwheels and pumps for irrigation, low-power steam engines, farm equipment such as rice threshers, milling equipment, conical rollers for grinding olives and hydraulic presses for pressing them, presses for wine production, scales, balances, weights and vehicles for transporting fruit and vegetables. The same was the case with the wood industry that had to manufacture boxes for packaging different products or barrels for wine. The need to the new machinery also stimulated the growth of mechanical workshops (Nadal, 1990).

The boost to irrigation works is particularly important. On the Mediterranean coast new canals were constructed (Ramon-Muñoz, 2013) and wells were drilled to convert rainfed land into irrigated land. The practice of extracting water from the subsoil grew substantially and made massive use of new technical resources, such as electricity, and petrol engines, that replaced the traditional systems of treadmills and manual pumps that had a limited capacity for moving water. These new technologies were also applied to the pumping of surface water. New technologies had begun to spread with the use of steam pumps to extract well water in the mid-nineteenth century, especially for the irrigation of oranges in Valencia. Together with the traditional lifting pumps, from the

beginning of the twentieth century other fuels began to be used, such as petrol, gas, and electricity. In 1916, these still accounted for only a small percentage of the land area irrigated from underground, but in the moving of surface water it already represented over 50% of the irrigated surface, with a clear predominance of electric pumps. These technologies expanded rapidly in the following years. (Calatayud & Martínez Carrión, 1998, 2005; Duarte et al., 2014). Overall, we could say that the development of the irrigation works was important. The use of irrigation water for exported agricultural products increased by 116% between 1860 and 1930 and the water needs of these export crops represented 31% of the increase in irrigation water embodied in agricultural production (Duarte, Pinilla & Serrano, 2014)⁸.

The marketing of export products also required the improvement of transport infrastructures. This was the case, for example, of the ports on the Mediterranean coast specialised in fruit and vegetable exports, such as those of Valencia, Alicante and Castellón, which had to be substantially improved. The rail infrastructure was essential for export expansion and when the main lines did not reach the producing areas, it was necessary to construct specific lines (Herranz, 2008). In Valencia, the different lines allowed products such as oranges to be exported to France and they also provided quick access to the main ports, rapidly increasing sea and rail transport when these infrastructures ended (Vidal, 2006). For exporting ordinary wine to France, during the culminating period of these exports in the 1880s, specific lines were built in order to connect with the main lines.

With respect to the forward linkages, these were also positive, although moderate. A part of the output exported corresponded to transformed products, which also implied the development of activities of the agro-food industry, in some cases generating a modernisation of the traditional facilities used.

The majority of MHPs were exported with a low level of transformation, but even so, the preparation of the products generated positive effects which, for example in the case of oranges increased the price earned by the producer by 56% before they left Spain (Simpson, 1992, pp. 135-136). An interesting industrial development also took place with the packaging of fruits and vegetables and the growth of the canning industry. This development was largely driven by external demand, particularly in regions specialised

⁸ To make these calculations the blue water used has been taken, that is, the volume of surface or groundwater evaporating as a result of the production of a commodity (Hoekstra & Chapagain, 2008).

in the production of fruit and vegetables, such as Murcia, Rioja or Valencia. The gradual introduction of modern machinery and the mechanisation of production processes was noteworthy, first with the use of steam engines and in the first third of the twentieth century with mechanical engines. This development, in turn, boosted the auxiliary industry of tin box manufacturing, which was completely mechanised, and the manufacture of wooden boxes and packaging and that of refrigeration facilities (Martínez Carrión, 1989 & 2002).

In the case of wine, the progress was very uneven, focused particularly on the renovation of the presses used. In the production of olive oil more relevant changes occurred; on the one hand the machinery traditionally used was substantially renovated and, on the other hand from the beginning of the century the mills were electrified (Zambrana, 1987). Furthermore, after the First World War, new oil refining technology enabled oils that had high acidity levels and were not suitable for consumption to enter international markets. In this way a certain industrial infrastructure was developed. It could be said that, particularly after 1914, the Spanish oil industry experienced an intense modernisation process, enabling it to converge technologically with Italy, which was the world leader (Ramon-Muñoz, 2013).

Finally, we should not forget that, although uneven and sparse, the export activities generated marketing opportunities with the development of autochthonous networks. This was clearly the case with the export of oranges to France. On the other hand, the foreign marketing of wine was mostly controlled by French traders in the case of ordinary wine and British traders in the case of sherry. Furthermore, orange exports to Great Britain were principally managed by British companies and those of olive oil by Italian companies. Undoubtedly, the enormous weight of foreign companies in these marketing processes limited their economic impact.

For exports as a whole, there were very positive spillover effects of final demand, depending, logically, on the activities and the position of the producers in the value chain. Both the profits earned through export activities and the higher wages paid in some of them, when their productivity was higher than that of crops intended for the domestic market, favoured an increase in the demand for goods of other sectors introduced by industrial development. This was particularly true when the degree of the concentration of the export activities was geographically high, as in the case of the MHPs in Valencia

(Palafox, 1996). The industrial activities that were boosted included textiles, ceramics, footwear or furniture (Calatayud, 2011).

We could conclude that, as indicated by Prados de la Escosura (1982, p. 19 and 1988) for Spanish trade as a whole, despite the moderate size of the export sector, it favoured economic development, enhancing the purchasing power of the economy and increasing real income through the improvement of resource allocation, as the comparative advantages of agriculture were taken advantage of, particularly in certain sectors, and factors of production were used more efficiently (Prados de la Escosura & Sánchez-Alonso, 2019). This idea coincides with the perspective of Federico (1988, pp. 190-192 and 1992, pp. 290) who observed for Spain and Italy substantially positive microeconomic dynamic effects of production for exports, even when they were limited by the relatively small size of the export sector. Also, Bajo-Rubio (2020) have found that exports contributed, although modestly, to Spain's economic growth, particularly in the second half of the nineteenth century when they essentially comprised agricultural or primary products, due to their higher productivity associated with the export sector.

The territorial impact of these effects was varied but in general there was a high geographical concentration. In the case of wine, despite the broad geographic distribution of production, there was a high concentration in the regions close to the coast and to France. As wine was a highly consumed product in the domestic market, its production was enormously dispersed throughout the country. However, the expansion of production generated by exports to France was highly concentrated in the region of the Ebro valley which was on the border and well communicated with France and the Mediterranean coast. In 1891, the highpoint of wine exports, of the eight provinces that produced over one million hectolitres seven were located in these two regions and represented 52% of Spain's production.

In olive oil, there was higher concentration (especially in some areas of Andalusia, and Aragon and Catalonia). Therefore, in 1933, only four provinces of Andalusia (Córdoba, Jaén, Málaga and Sevilla) represented 41% of the value of its production. In this case, it was not the proximity to the export markets that was the key factor explaining this location, but the agro-climatic conditions for the development of olive cultivation.

In MHPs, there was a high concentration on the Mediterranean coast. If we take oranges, the most important export product in the first third of the twentieth century, their production was extremely concentrated. In 1934, only four provinces of the

Mediterranean coast (Alicante, Castellon, Murcia and Valencia) represented 82% of the value of its production and only one of them (Valencia) 43%. In MHPs, the location of the principal exporting regions could be explained both by their easy access to sea ports and the conditions for the cultivation of these products.

6. Conclusions

The Spanish agricultural export sector was a key element in the international integration of the Spanish economy during the first wave of globalisation. It represented a very large part of total Spanish exports and grew significantly, at a similar rate to global agricultural trade as a whole. Its behaviour was more dynamic than that of production intended for the domestic market and therefore its share of production increased from the mid nineteenth century until the years leading up to the Second World War. When broken down by product, the behaviour of agricultural exports was very diverse. In particular, three products stand out for their importance throughout the whole period: wine, MHPs and olive oil. Furthermore, the former two dominated the growth of exports in the second half of the nineteenth century and the first third of the twentieth century, respectively. They also gained very important positions in international markets.

We have shown that, although the growth of agricultural exports was not the key factor for the expansion of production, it made a significant contribution. Furthermore, the contribution of the three afore-mentioned groups of products was essential.

Agricultural exports grew thanks to the boost received from external demand, but also due to relevant changes made in the supply as a consequence of the higher relative returns of the export crops and the competitiveness reached in international markets. The fall in trade costs also favoured export growth, as did trade liberalisation, particularly in the second half of the nineteenth century.

However, a higher growth of agricultural exports was limited by the fact that some of the principal export products did not become products of mass consumption that were highly integrated in the diets of the populations of countries whose income grew the most due to the good rhythm of their industrialisation processes, as in the case of wine and olive oil. The growing protectionism in some markets from the end of the nineteenth century such as those in the America continent, or France for wine, affected the performance of the export sector.

Export expansion, therefore, made a positive contribution to economic growth. Agricultural trade exerted moderate but positive linkages and externalities on the Spanish economy in the period under study. We can identify significant backward linkages, as a result of the demand for inputs by export-oriented agriculture, such as fertilizers and other products from the chemical industry, machinery and products from the metal industry, the development of irrigation and modes of transport. There were also forward linkages for the agrofood industry which, in significant cases, such as vegetable preserves, fruit, olive oil or wine, clearly grew, driven by external demand. Finally, the export activities generated final demand linkages, particularly when they had a certain degree of geographical concentration.

Significant externalities were a more efficient allocation of resources, and the exploitation of the natural advantages through specialisation in products with a high external demand, and which in some cases, such as the MHPs, had limited potential growth in the domestic market due to the low level of income per capita in Spain. As pointed out by Prados de la Escosura & Sánchez Alonso (2019), all of this ‘represented a positive development in a situation where trade provided a “vent for surplus” of Spain's natural and human resources’.

It may be concluded that the contribution of the agricultural export sector to Spain's economic growth was positive although moderate. It contributed to financing necessary imports during the industrialisation process, it favoured a more efficient allocation of resources and produced intersectoral linkages. However, the geographic concentration of production for export spatially limited its impact on the Spanish economy.

Acknowledgements: This study has received financial support from the Ministry of Science, Innovation and Universities of Spain, project PGC2018-095529-B-I00 and from the Government of Aragon, through the Research Groups, S40_20R and S55_20R and FEDER. The authors wish to thank Pablo Castro, Domingo Gallego, Alfonso Herranz, Ramon Ramon and participants at the Rural History Conferences (Bern, 2013 and Paris, 2019) for their comments.

Declaration of interest Statement: We wish to confirm that there are no known conflicts of interest associated with this publication.

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