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Product differentiation and entry barriers: Mediterranean export firms in the American markets for olive oil prior to World War II

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Abstract

This article analyses the entry process of Mediterranean export firms in the American markets for packaged olive oil between the 1880s and the 1930s. It explores whether those entry barriers traditionally identified by the literature emerged and to what extent they influenced such an entry process. Using trade data for the early 1930s, the article shows higher average levels of exporters' concentration in the Americas than elsewhere. It also documents that by around 1930 most of the Mediterranean firms leading packaged olive oil exports to Argentina and the USA had entered the markets on the other side of the Atlantic before World War I. Finally, it identifies product differentiation as a source of entry barrier in markets for packaged olive oil in the early 1930s. The article suggests that as the American markets for this product matured early-entrant advantages associated with the use of modern marketing became more apparent, which probably raised the cost of entry to new Mediterranean export firms during the inter-war period.

Keywords:

Olive oil; international trade; nineteenth and twentieth centuries; Mediterranean; Americas; brands; marketing; product differentiation; entry barriers; early-movers advantages; industrial organisation; economic history; international business history

Introduction

The entry of new competitors into a market is a basic issue in the industrial organisation literature. There is no doubt that both market growth and expected post-entry profitability have a positive effect on entry. Nevertheless, the entry in markets also depends on the height of barriers to entry, namely, the obstacles found by the firms that want to enter a given market. The literature has generally identified three basic sources of barriers. The first is absolute cost advantages of

incumbents over entrants. The second deals with economies of scale on the supply side because to successfully enter a market a minimum efficient scale of plant relative to the market may be required. The third source of barrier has to do with product differentiation and the existence of certain market power at firm level. In general, this is associated with packaging, branding and advertising strategies of the established firms, consumers' loyalty to established brands and firms and the existence of sunk costs of both consumers and entrant firms.

The potential relationship between the rise of modern marketing and the emergence of entry barriers has also been of interest to business historians. This article aims to contribute to improving our understanding of this link by analysing the entry process of Mediterranean export firms in the American markets for packaged olive oil prior to World War II. In particular, it explores whether those entry barriers traditionally identified by the literature emerged and, if so, to what extent they influenced such an entry process. One of the main conclusions of the article is that entry barriers (measured by levels of exporters' concentration) substantially differed across markets. On average, entry barriers were higher in the Americas than in the Old Continent. Product differentiation seems to explain part of this difference. As the American markets for packaged olive oil matured, early entrants' advantages arose partly associated with product differentiation. This probably made the entry of new Mediterranean export firms into these markets more difficult after World War I.

The article is organised as follows. The first and second sections give an overview of the dynamics of export firms' entry in the Americas between the 1880s and 1938. This is followed by a short survey of the main literature on entry barriers and first-mover advantages. Using available data for Spanish export firms in the early 1930s, the fourth section documents exporters' concentration across individual markets as a proxy for entry barriers. The next section explores the determinants of these entry barriers in the main foreign markets for brand-name olive oil. The paper ends with the conclusions.

The entry of Mediterranean exporters in the American markets for packaged olive oil prior to World War I

Until the last decades of the nineteenth century, the consumption of olive oil remained at very low levels in the Americas. This situation was, however, modified after the 1870s, as a massive southern European emigration crossed the Atlantic Ocean (Ramon-Muñoz, 2009). Clearly, the three decades prior to 1913 represented a period of rapid growth for olive oil trade in the Americas. They also stood for a period of formation for most of the olive oil markets on the other side of the Atlantic. During these years, consumers' preferences were created and commercial networks were progressively set up.

Favoured by market growth as well as the opportunity to enhance sales, the number of exporting firms that crossed the Ocean and entered the markets of the New World rapidly increased between 1880 and 1913. Unfortunately, this phenomenon is impossible to quantify on account of a lack of appropriated information. Therefore, the question of firms' entry to the Americas can only be

treated at a very superficial level, using qualitative information as well as sources that are too incomplete to offer a comprehensive picture of the process.

[Table 1 about here]

Table 1 lists what appears to have been the most reputed or better-known brands (and firms) that were operating in Argentina (one of the largest markets of the continent) in the years circa 1887, 1900 and 1913. The list has been made on the basis of information provided by both the Spanish and the Italian consuls. Although imperfect, the data presented in Table 1 is clear in showing the existence of a remarkable increase in the process of entry throughout the 30 years prior to World War I. According to this information, the number of firms operating in Buenos Aires would have more than doubled between c. 1887 and c. 1913. The number of brands also rapidly increased. In this respect, it is worth noting that prior to 1913 a process of brand proliferation had taken place in Argentina and "an infinity of secondary brands ha[d] the name of wholesalers and retailers" (Ministero di Agricoltura, Industria e Commercio [MAIC], 1913, p. 187, the translation is mine). This was neither specific nor new to the Argentinean olive oil trade. In other countries of the New World, domestic traders also established their own brands, while this was quite an extended practice in other food and drink goods, such as wine, during the nineteenth century (Duguid, 2003; pp. 424–432; Simpson, 2004, p. 91).

Certainly, the information presented in Table 1 does not say anything about the consequences of the entry process in terms of either firms' share or regarding firms' ranking. Although impossible to know in detail, it is obvious that the entry of new competitors in Argentina modified the market position of the incumbent firms between the 1880s and the outbreak of World War I. In this connection, the case of an Italian firm, Giuseppe Ottone & Figli, needs to be pointed out. Set up in Genoa in the nineteenth century, Ottone soon took the lead in Argentina. Between the mid-1880s and the early 1890s, it accounted for around half of the Argentinean olive oil market share. By then, Italian olive oil represented 70–80% of total Argentinean imports, which means that throughout these years Ottone was the Italian leader in Argentina. Because of this, it has been considered that this company formed the basic taste for olive oil in Argentina (Fernández, 2004, p. 95; Ministerio de Estado, 1899, pp. 47–48).

However, Ottone's reign did not last forever. In the course of the two following decades, Ottone still stood out from most of the Mediterranean export firms trading with Argentina, but was losing ground relative to other Italian and Spanish competitors. Thus, it cannot be discounted that by 1913 Tommaso Moro & Figli, another Genoese firm, had already replaced Ottone as the largest Mediterranean exporter of olive oil to Argentina.

Of course, Ottone was not alone in losing share as new competitors entered the Argentinean market. During the three decades preceding the outbreak of World War I, two well-known French firms seem to have experienced a similar situation. One of them was a firm called James Plagniol (brand Plagniol) which was set up at the beginning of the nineteenth century in Marseilles. The other was also a Marseilles firm named Adolphe Puget (brand Puget) which was established in 1857. With presence in the Americas long before the 1880s, these two firms were able to achieve a great reputation for their olive oils because they manufactured a

high quality product (ME, 1899, p. 48; Galula, 1985, p. 126).

The available evidence suggests that between the late 1880s and the early 1910s the share of these two firms might have been reduced while their reputation as providers of a high-quality olive oil remained untouched. Unfortunately, the lack of detailed data makes it impossible to know the extent of this likely reduction. If Plagniol and Puget are assumed to have accounted for the bulk of French olive oil exports to Argentina, then the share losses might have been significant. In any case, there is no doubt that French olive oil exports (and probably the market position of French firms) substantially declined relative to the Argentinean market. Between 1885–89 and 1909–13, their share fell 11 percentage points, from 15% to 4% (Fernández, 2004, Appendix 2).

As other early entrants, the Spanish export pioneers also lost share from the late nineteenth century. One of these Spanish pioneers was Manuel Porcar y Tió. Originating in the Catalan city of Tortosa, in the 1870s, this entrepreneur was already operating in the Antilles and Rio de Janeiro (Brazil); and in the 1880s he was leading a small group of Spanish exporters to Argentina, which included firms such as Quinzà, Conill Hermanos and Sensat. Nevertheless, from the first years of the twentieth century, Porcar y Tió, as well as other pioneering firms, faced strong competition from other Spanish exporters, especially from the Catalan José Bau. Also established in the city of Tortosa in 1842, Bau had begun to export olive oil to Argentina around 1900, and by 1913 he had already become the largest Spanish olive oil exporter to this South American country as well as one of the most important Mediterranean firms in terms of olive oil exports to Argentina (Boletín del Centro de Información Comercial [BCIC], 25 March 1914, no. 289, p. 2).[1]

The entry of new firms into the market accelerated not only in Argentina after the 1880s, but also in many other markets in the Americas. If market growth serves as an indicator of the dynamism of entry, it is clear that export firms' entry was very intense in the USA after 1880; in Brazil and Chile after 1890; and in Uruguay and Mexico after 1900. In these countries, olive oil consumption achieved annual rates of growth of over 5% in the two or three decades before World War I.

The entry of Mediterranean exporters in the American markets for packaged olive oil after the outbreak of World War I

Did new exporters of packaged olive oil enter into the Americas during the inter-war years? The answer is positive, as shown in commercial reports and trade journals. The question becomes whether during the inter-war period the process of entry of Mediterranean exporters into the American markets for brand-name olive oil was as intense as in previous decades.

Judging from the available evidence on trade and other anecdotal information, the

[1] As can be deduced from the previous description, most of the Spanish early movers were Catalan firms. In this respect, it is worth noting that the majority of Mediterranean exporters that entered the Americas earlier came from regions characterised by manufacturing a high-quality product, including Provence in France, Liguria and Tuscany in Italy and Catalonia in Spain (for the particular case of Spain, see, for example, Hernández Armenteros, 2001; Nadal, 1989; Parejo & Zambrana, 1994; Pinilla, 1995; Ramon-Muñoz, 2000b; Simpson, 1995; Zambrana, 1987).

process of (gross) entry seems to have enormously accelerated during the years of World War I. The facts can be summarised as follows. Italy and France, which supplied a large share of the packaged olive oil consumed into the Americas, were involved in the Great War. Therefore, Spain was transformed *de facto* into the only producing country with capacity to supply olive oil to the American continent (Ramon-Muñoz, 2000b; Zambrana, 1987). This caused many Spanish firms to enter markets on the other side of the Atlantic, whereas the contrary holds true for French and Italian firms.

The entry of new Spanish exporters is only a part of the story, however. The other has to do with the tendency of importers and domestic traders to establish their own lines of products and brands in the New World. As mentioned, this phenomenon was already in force prior to 1913, but during the war years it continued (and perhaps reinforced). To give an example, prompted by lower tariff rates, bulk olive oil imports to be blended, packaged and branded boomed in the USA from 1897 to 1913, and doubled during the conflagration years. As a result, in the period 1914–19, they accounted for more than half of the total USA olive oil imports.[2]

The end of the war, and the following two decades, marked a new period in the process of entry and exit, which was characterised by two main breaking points. The first had to do with a certain return to normality. The Italian and (to a lesser extent) the French firms resumed their exports, whereas some of the Spanish firms that had entered the market during the war years progressively abandoned the Americas during the course of the 1920s. The second breaking point was related to the 1929 international crisis. The collapse of the American markets for olive oil discouraged the entry of new export firms, and also seems to have accelerated a process of exit. The Spanish Civil War was also a catalyst in this process and caused many Spanish to abandon these markets. These factors led to an increase in consumption of Turkish and Greek olive oil on the other side of the Atlantic. However, the olive oil being exported from these two Eastern Mediterranean countries was mostly traded in bulk to be used for blending and packaging purposes by domestic firms rather than traded in cans and bottles to be directly consumed by the end consumers.

[Table 2 about here]

In conclusion, it is likely that when the inter-war period is taken as a whole, the entry of Mediterranean export firms into the Americas had been less intense than in previous decades. This was probably more apparent among the group of the most reputed and better-known export firms. Table 2 identifies the largest Italian and Spanish exporters of packaged olive oil to Argentina and the USA around 1930.[3] With the exception of six firms (and perhaps fewer), the rest of the 23 olive

[2] For more details on the USA market, see, for example, Ramon-Muñoz (2000a, 2000b) or Taylor (2000).

[3] The trade data used in the construction of Table 2 have two different origins. For Argentina, the information has been elaborated on the basis of commercial reports for the period between 13 September 1932 and 31 December 1933 (Ramon-Muñoz, 2000c, p. 200). For the USA, figures at firm level come from Espuny (2002, pp. 48–51), a Spanish olive oil exporter who travelled to the USA in 1929 in order to know the characteristics of this market. Using this source as well as the USA foreign trade statistics (*The Foreign Commerce and Navigation of the United States*, several years), Table 2 shows what might be the lower and upper bounds of the actual values, but further research

oil exporters listed in the table had begun to export to the other side of the Atlantic prior to 1914. Furthermore, a significant number of these 23 firms had already achieved leading positions (or, at least, were well-known firms) in the Americas by the eve of World War I or before.[4]

Francesco Bertolli was one of them. By the late 1920s and early 1930s, it was one of the most successful firms in the USA. It was also a leading firm in Brazil and probably in other Latin American markets. However, the importance of Bertolli as an olive oil exporter was not a novelty of the inter-war period. In 1913, the Italian Chamber of Commerce of San Francisco reported that olive oil from several brands was consumed in California, but only "the brands Francesconi and Bertolli were credited all over the USA" (MAIC, 1913, p. 139, the translation is mine). In the same years, the Italian consuls in Brazil and Colombia mentioned the name of this Tuscan firm in their reports, while it is also known that before 1913 Bertolli was involved in commercial business between Argentina and Italy (MAIC, 1913, pp. 238–274; Segreto, 1988; Stumpo, 2003).

Of the Spaniards, Hijos de Ybarra was the firm that in the early 1930s exported the most canned olive oil to the Americas. Set up in 1842, this was a solid company involved in several businesses, including wine production, finances, mining, shipping, and, of course, olive oil production and trade (Díaz Morlán, 2002; Sierra, 1992, pp. 38–61). The point that needs to be stressed is that Ybarra had probably entered the Southern American markets for olive oil during the first decade of the twentieth century. The available information suggests that by the eve of World War I Ybarra's position was weak in Argentina as well as in the USA. However, it was stronger in other places on the New Continent, such as Mexico and perhaps in some other small Latin American markets (MAIC, 1913, p. 111).

Of course, Bertolli and Ybarra were not alone on the other side of the Atlantic. Table 2 makes clear that in the late 1920s and early 1930s other Tuscan and Ligurian firms such as Fratelli Berio, Giacomo Costa, Carlo Daneri, Escoffier Guidi, Joseph Lupi, Tommaso Moro, Giorgio Ottone, Pietro Salvo, SALOV or P. Sasso had achieved leading positions in the Americas. It also shows that Bau, Carbonell, Longoria, Luca de Tena and Sensat had taken the lead among the Spanish exporters. Again, it must be stressed that all these firms had entered the markets on the other side of the Atlantic relatively early, and by the first decade of the twentieth century many of them were also well known there (Castejón, 1977; Cerisola, 1973; Isolica 1996/97; MAIC, 1913; Muguerza, 1909; Ramon-Muñoz, 2010).

The dynamics of the Mediterranean olive oil export firms in the Americas is far from completely understood. Nevertheless, at the present stage of research the available evidence suggests that relative to previous decades, the entry of new brand-name olive oil exporters in the Americas decelerated during the 1920s and 1930s, and that when entry took place it was probably focused on the periphery rather than on the core of the export industry.

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is required in order to produce more accurate data. For a more detailed description of sources, see also Ramon-Muñoz (2010).

[4] The firms that did not export packaged olive oil to the Americas prior to 1914 were Olivarera del Mediterráneo, ASTOR, Hijos de José Sabater and, perhaps, Vincenzo Salvo, Frugone & Preve and Daneri.

The determinants of entry into markets: a short overview

Having said this, the question that immediately arises is how the entry process to the Americas might be understood. The existing literature on the determinants of entry into markets suggests different answers to this question. At first glance, the subject of new entry into markets might seem quite a simple issue. Firms decide whether to enter markets depending on their expected post-entry profitability. However, the fact is that profitability (and therefore entry) is determined by many factors. These include market structure (i.e. the height of barriers to entry), the existence of potential early-entrant advantages, the response of incumbent firms when they face the threat of potential new entrants, and market evolution (i.e. the dynamism or maturity of markets).

Among all these factors, entry barriers and early-entrant advantages have become basic issues in the literature dealing with entry, exit and survival. The connection between entry process, entry barriers and advantages of incumbent firms has existed in the economic literature for a long time. As early as 1956, Joe S. Bain argued that the condition of entry in a given industry was associated with the existence of entry barriers. He defined this as "the advantages of established sellers in an industry over potential entrants" (Bain, 1956, p. 3). These advantages allowed incumbent firms to earn supernormal profits without threat of entry. Bain also argued that there were three major types of entry barriers or three major advantages to incumbent firms: economies of scale advantages, absolute cost advantages and, finally, product differentiation advantages.

Since the publication of Bain's seminal study, the bibliography devoted to analysing the real influence of these three barriers on entry has become vast. In spite of this, both theoretical analysis and empirical works have not provided conclusive answers. An example of this is found in the case of product differentiation. In theory, product differentiation gives the early entrants the advantage of forming consumers' preferences, whereas late entrants face supplementary costs, as they have to change these preferences. Consumers' preferences for established firms' products are in part the result of advertising campaigns and other marketing strategies. This helps to create brand loyalty and niche markets, which contribute to the emergence of monopoly power at firm level (Schmalensee, 1974). Consumers' preferences for established firms' products also arise in the presence of switching costs. These are the costs incurred when a customer changes from one supplier to another (Schmalensee, 1982). In this context, pioneering firms and brands may have some advantages over potential new entrants, since the latter may have to incur additional costs in the form of price cuts, advertising campaigns and other marketing strategies in order to persuade consumers to buy a new brand. These can be considered sunk costs (Sutton, 1991). If the product launched by the potential entrant is not successful in the market, the associated costs will be impossible to recover. The final consequence would be that product differentiation would benefit early movers, whereas for potential entrants it would raise entry barriers and discourage entry.

Although many studies have defended the role of product differentiation as an entry barrier, the fact is that there are also others that have questioned the

advantages of established firms based on product differentiation.[5] For example, it has been argued that the overall effect of advertising on entry is positive (Kessides, 1986) or also that switching costs are more obvious in some products than in others (Mueller, 1991). A conclusive answer regarding the consequences of product differentiation on entry is not easy to give. Nevertheless, in the early 1990s Geroski concluded that "although difficult to think of as a structural entry barrier, [the] influence [of product differentiation advantages]... is hard to deny" (Geroski, 1991, p. 204; see also Geroski, 1995, p. 429).

In addition to entry barriers, entry may also be affected by the evolution of markets. Thus, it has been suggested that entry rates vary over time depending on the maturity of markets (e.g. Agarwal & Gort, 1996; Geroski, 1995; Gort & Klepper, 1982; Mueller, 1991). Rates of entry are expected to be relatively high in young industries or markets and the other way around. Interestingly, in arguing why entry declines in mature markets, three main reasons associated with the potential advantages of early entrants are suggested. First, consumer preferences have become reasonably well formed; second, distribution systems have already been set up; third, the leaders tend to be protected by their product images as well as some other advantages closely connected with the fact of being an early entrant in the market. Consequently, in mature markets new entrants face disadvantages relative to the incumbent firms, whereas entry tends to be largely limited to the industry's periphery.

Although many empirical analyses have found that pioneering firms tend to have higher market shares than later entrants, the advantages of the early movers can be exaggerated. In fact, first-movers also have disadvantages, while there are advantages for later entrants. These latter may learn from the mistakes of the former and may avoid technological and demand uncertainties.[6] In part because of this, some authors have questioned the general idea that pioneers have long-lived market share advantages (e.g. Golder & Tellis, 1993).

The literature on business history has also dealt with these issues, particularly in works on food and beverages. In general, it has been argued that pioneer advantages existed and acted as barriers to entry, although to become effective such advantages have to be supported by a number of factors, including, among others, the capacity of managing external and internal change, product upgrading and marketing investment (e.g. Lopes, 2007; Lopes & Casson, 2007; Jones, 1994; Tedlow, 1990, 1993). Branding and advertising are, certainly, important strategies to retain (or to increase) market shares (e.g. Collins, 1994; Weir, 1994).[7] In some cases, however, incumbent firms' investments in product differentiation may not prevent entry (Mata, 2009), while some authors have relaxed the connection between product differentiation, first-mover advantages and entry barriers (Balasubramanyam & Salisu, 1994).

[5]For a survey of the empirical literature, see, for example, Comanor and Wilson (1979), Schmalensee (1989) and Geroski (1991).

[6] For a review of this literature, see, for example, Lieberman and Montgomery (1988, 1998), Robinson, Kalyanaram and Urban (1994) and Kalyanaram, Robinson and Urban (1996).

[7] For a more general discussion on the nature and functions of brands see, for example, Wilkins (1992, 1994) and Casson (1994). See also Church and Godley (2003a, p. 1), regarding the interpretation of marketing as a cause of industrial concentration and barrier to market entry.

Entry barriers and exporters' concentration across markets in the early 1930s

So, which of the factors traditionally suggested by the literature better explains the entry process of Mediterranean exporters of packaged olive oil to the Americas prior to World War II? Before giving any answer, it is worth noting that in the early 1930s most of those firms leading packaged olive oil exports on the other side of the Atlantic had already penetrated the markets of the Americas prior to World War I. This may suggest the existence of a sort of early-mover advantage and, therefore, entry barriers for potential later entrants. Consequently, it could be argued that the likely post-World War I reduction in entry of Mediterranean exporters to the American markets for packaged olive oil was due to the existence of increasing entry barriers in most of the markets on the other side of the Atlantic.

[Figures 1 and 2 about here]

The most important point in the confirmation of this hypothesis is to show that entry barriers were generally higher in the Americas than elsewhere. However, the problem is how to measure the height of these barriers. According to the classical literature on industrial organisation, the structure of markets tends to differ depending on the height of the entry barriers. More precisely, the higher the entry barriers in a given industry or market, the stronger the levels of firms' concentration in that market. There is no reason to think that foreign markets for olive oil performed in a different way. Therefore, one possibility is to look at exporters' concentration across markets in order to obtain a proxy measure for entry barriers. If entry barriers were really higher in the Americas than elsewhere, one would expect to find higher levels of exporters' concentration in the former rather than in the latter markets.

[Table 3 about here]

Unfortunately, analysing the structure of foreign markets for olive oil prior to World War II is not an easy task because quantitative evidence is extremely scarce. The only systematic information I have been able to find comes from Spain. It refers to the export orientation of a wide sample of Spanish olive oil firms for the period 1930–34, which on average represented around 90% of the total olive oil exported from Spain.[8] This information is summarised in Figures 1 and 2 and Table 3.

Two alternative concentration indexes are presented. The first one is the four-firm concentration ratio (C_4). It is calculated by summing up the shares of the four largest Spanish exporting firms in a given market relative to the olive oil exported to that market by all the Spanish firms in the sample. The second index is the Hirschman–Herfindahl index (HHI). In contrast with C_4, the HHI takes into account the shares of all the firms in the market, as it is calculated by summing up the squared market shares of each Spanish firm in the selected export market.[9] In spite

[8] For further details on these data, see Ramon-Muñoz (2000b, 2000c).

[9] Again, firms' market share is estimated relative to the total olive oil exported to that market by all the Spanish firms in the sample. The HHI ranges up to 1 or up to 10,000 if percents are used. For a further discussion in the use of alternative measures of concentration in the industry, see, for example, Clarke (1985, chapter 2).

of their differences, the results presented in both Figures 1 and 2 and Table 3 tell the same story. They show a remarkable variation on exporters' concentration across foreign markets. This suggests that market structures, and therefore entry barriers, also differed across foreign markets.

The key point is to assess whether levels of concentration of Spanish olive oil exporters were higher in the American markets than elsewhere. At first glance, the results shown in Figures 1 and 2 as well as Table 3 (columns II and III), do not seem to confirm the existence of higher concentrations of exporters for the markets of the Americas relative to the rest of the world. To start with, a simple inspection of Figures 1 and 2 makes it clear that together with the Central and Southern American Republics several Northern European countries also stood out from the rest of the countries included in the sample. At a regional or continental level, the results are not very different. The unweighted average of the 22 markets of the New World included in the sample yielded a level of exporters' concentration that was practically the same as the 16 markets of the Old Continent when measured by the C_4. If measured by the HHI the results are still more surprising. On average, the former had a concentration level 4% lower than the latter (Table 3, columns II and III).

According to these results, it would seem obvious to conclude that in the Americas, entry barriers for potential olive oil exporters were similar to other markets. Consequently, other factors would explain the likely decline of entry of brand-name olive oil exporters to the New World after World War I. However, this could be a misleading conclusion. The literature on industrial organisation has not only made it clear that levels of concentration are determined by entry barriers, but has also pointed out that concentration can also be associated with the size of the markets. It has argued that *ceteris paribus* a negative relationship between market size and concentration level should be expected, since an expansion in the size of the market not only raises the profitability of incumbents, but also the expectation of profits. These facts tend to induce potential competitors to enter the market, causing concentration to fall (Schmalensee, 1989; see also Sutton, 1991).

The size of the market certainly seems to determine the results plotted in Figures 1 and 2, as well as those shown in Table 3 (columns II and III). One of the most salient characteristics of the markets with the highest levels of concentration is that they were all small markets by Spanish olive oil foreign trade standards. Thus, as most of the 43 markets considered in our sample are relatively small, concentration levels appear to be mostly determined by market size

The picture changes radically when the market size effect is neutralised either by using aggregated information at regional and continental level or by considering only the largest markets in the sample. As shown in Table 3 (columns IV and V), levels of exporters' concentration become higher in the Americas as a whole rather than in any other continent or region. For example, by 1930/34 the New Continent had on average levels of exporters' concentration between 23% and 26% higher than the Old Continent, depending on the measure of concentration used. In addition, levels of exporters' concentration were especially high in the Southern part of the Americas. They had an index between 1.7 and 2.2 higher than in Europe. The results would not substantially change if instead of looking at regions or continents, we looked at the largest markets on both sides of the Atlantic (Ramon-Muñoz, 2000b, p. 117).

The sources of entry barriers in the Americas: hypotheses and evidence

To sum up, the available evidence suggests that entry barriers were generally higher in the Americas than elsewhere. The question that immediately arises is why entry barriers became higher in the Americas. As mentioned above, the literature on industrial organisation has suggested three basic categories of entry barriers. These include product differentiation, which tends to lead to the existence of certain market power at firm level, economies of scale on the supply side and, finally, absolute cost advantages of incumbents over entrants.

Product differentiation

In the case of the Americas, product differentiation seems to be the obvious candidate. This is mainly due to the marketing strategies that followed most of the exporting firms trading olive oil to the New World since the last decades of the nineteenth century. They have included the use of modern marketing techniques, which confirms what other studies have shown: from the nineteenth century onwards modern marketing spread over a wide variety of consumer goods industries and played an important role in enhancing competitiveness.[10]

In the late nineteenth and early twentieth centuries, international markets for olive oil could be divided into two main categories in terms of export marketing. The first corresponded to those import markets where the product generally came in bulk, to be used either as a raw material or to be submitted to further manipulations before arriving with the final consumer. The second category corresponded to those markets where exporters mainly sent a finished product, to be directly consumed by the end user. The markets on the other side of the Atlantic mostly fell into this latter category (Ramon-Muñoz, 2000a, pp. 160–168).

Thus, packaging, branding and advertising became essential factors in penetrating the American markets for olive oil. This was so in the formative phases of these markets. To give an example, in explaining the success of the Spanish exporter José Bau in Argentina prior to World War I, many contemporaries considered a crucial factor that he regularly (and intensively) advertised his products in journals and newspapers (BCIC, 10 November 1913, no. 280, p. 1; BCIC, 25 March 1914, no. 289, p. 2; MAIC, 1913, pp. 187–188).

During the inter-war period, the use of modern marketing continued to be as important as it had been in pre-war years, and probably even more. This was because new and more expensive methods of advertising developed. In 1932–33, two reports published in the journal of the Spanish olive oil exporters pointed out that some Spanish export firms used an "active and suggestive" way of advertising their brands consisting of a "raffle of money prizes among their consumers".

[10] See, for example, Wilkins (1992), Tedlow (1990), the chapters in the volumes edited by Tedlow and Jones (1990), Jones and Morgan (1994) and Church and Godley (2003b), respectively, Church (2000) or Lopes (2007). See also the works on the evolution of branding over the nineteenth and twentieth centuries by Duguid, Lopes and Mercer (2007) and Sáiz and Fernández (2009), which are based on registration data for France, the USA, the United Kingdom and Catalonia (Spain).

Advertising in radio was also mentioned. Moreover, the same studies suggested a close relationship between advertising and firm market shares by arguing that the largest firms invested a significant amount of their resources in advertising their products. These reports indicated that, in the early 1930s, large firms invested, on average, one Argentinean peso per box of olive oil. This means that advertising costs would have accounted for 1.5–7.2% of the final value of the product, depending on the information used in the calculations (*El Aceite de Oliva de España* [AOE], November 1932, no. 48, pp. 299, 301, and March 1933, no. 52, p. 69).[11]

[Figure 3 about here]

The fact that packaging, branding and advertising were extensively used in the Americas had some interesting consequences. The most obvious was that by making use of these marketing strategies, product differentiation arose, which contributed to increasing entry barriers for new entrants. Figure 3 provides evidence suggesting that this was indeed the case, at least in the early 1930s. The figure correlates Spanish exporters' concentration (C_4) in large markets on both sides of the Atlantic versus the percentage of Spanish olive oil exported in small packages relative to total Spanish olive oil exports to the selected market. Although imperfect, this latter measure is taken as a proxy of the use of modern marketing techniques, and therefore product differentiation.[12] It is also worth noting that in order to avoid the influence of market size on concentration; the exercise only takes into account the largest foreign markets for Spanish olive oil. Bearing all of this in mind, it is quite clear that levels of concentration tended to increase as modern marketing techniques were used more intensively. As packaging, branding and advertising were extensively applied by most of the exporters involved in trading olive oil to the other side of the Atlantic, the conclusion seems obvious: product differentiation advantages of established firms acted as a significant barrier to entry in the American markets for packaged olive oil.[13]

Although evidence at firm level is not available, the reasons explaining why product differentiation created entry barriers can be immediately deduced in the light of the literature reviewed above. First, the use of modern marketing strategies probably increased the capital requirements for entering brand-name olive oil markets. Second, these same strategies perhaps raised sunk costs for potential entrants. Last, the growing use of advertising and other modern marketing techniques probably created consumers' loyalty to established brands and firms. This would have led to the existence of certain market power at firm level.

Consumers' loyalty had to be cultivated, however. As has been noted, in the 1930s

[11] For the sake of comparison, it can be mentioned that by 1935, the percentage of total advertising expenditures over total net sales on food products and health drinks was 2.9% in the UK. This figure was 4.7% in the case of total consumer goods (Corley, 1994, p. 223).

[12] The percentage of olive oil traded to foreign markets in small packages appears to be quite adequate as a proxy for packaging and branding. However, it is very imperfect as a proxy for advertising. In this case, it would be appropriate to use the advertising expenditures–sales ratio, which is also used as a measure of product differentiation barriers. Unfortunately, there is no detailed information regarding the expenses in advertising of the Spanish exporters for the period 1930–34.

[13] For example, by 1925–29 around 73% of the total olive oil imported in the Americas was packaged in cans and bottles, whereas in Europe this percentage was a mere 7%.

Spanish reports on the Argentinean olive oil market suggested a close link between advertising expenditures and market shares owing to the fact that the largest export firms invested a considerable amount of their resources in advertising. To this must be added that most of the firms mentioned in these reports were early movers in that they had entered the American markets before World War I. Although fragmentary, this evidence suggests how important it could be for early movers to continue to invest in marketing in order to keep market shares, a question that, as shown above, has already been pointed out by the historical literature on branding and marketing.

Scale economies and capital requirements

Commercial information at firm level suggests that economies of scale may have been at least as important as product differentiation. In 1925, the manager of the Catalan firm Hijos de José Sabater asked his agent in Sao Paulo (Brazil) about the (low) level of orders for the firm's brands. In justifying why the agent should be more active, Sabater stated that only by increasing sales would his firm be able "to use the equipment more efficiently, which [would] allow [him to offer] better selling conditions" to his clients. Similar reasoning was made in a letter written by the manager of the company to his agent in Rio de Janeiro (Brazil).[14] If these views are correct, then the size of the firm acted as an entry barrier in the Americas, since a minimum efficient size would be required for penetrating packaged olive oil markets in order to take advantage of economies of scale.

Closely connected to the question of the existence of a minimum efficient size, there is the issue of capital requirements for entry into international markets for olive oil. The available evidence suggests that these requirements were higher in the packaged olive oil market than in the bulk one (Manjarrés, 1872, p. 156; BCIC, 15 December 1910, pp. 2–3; Ramon Muñoz, 2000a, pp. 160–162, and 2010). Part of this was due to the fact that the production of packaged olive oil was more capital-intensive than the manufacturing of bulk olive oil. Trading packaged olive oil abroad also increased capital requirements, *inter alia*, because of advertising expenditures.

[Table 4 about here]

Were those firms more orientated to trading packaged olive oil larger than those focused on exporting bulk olive oil? If so, were the former better capitalised than the latter? Table 4 provides some evidence on these issues. It displays data elaborated from a sample of 61 Spanish export firms in the early 1930s. These firms accounted for around 90% of the total olive oil exported by Spain in the period 1930–34. Two different groups of export firms are shown in the table. Group I includes exporters for which Latin America was their main export region. Note that Latin American markets mostly demanded brand-name olive oil for final consumption. This could indicate that a significant share of the olive oil exported by the firms belonging to this group was packaged olive oil. In contrast, Group II integrates firms that mainly orientated their exports towards the Old Continent.

[14] Arxiu Comarcal del Baix Camp (Reus). Fons Sabater. *Copiador de Cartas. Salidas. América*, 4 February 1925, p. 299; 16 February 1925, p. 341; 5 May 1926, pp. 464–465.

This group also includes those firms that mostly exported bulk olive oil to the USA.

Table 4 shows several indicators for the measurement of firm size. One of them is nominal capital per firm and is used as a proxy for firm capital requirements. It is worth noting that there is a clear association between the indicators used for measuring firm size and firm nominal capital, since it is obvious that a large firm requires larger amounts of physical capital and vice versa (Bain, 1956, pp. 156–157). Needless to say, all the indicators presented in the table are clearly imperfect. This is partly due to the lack of appropriate data and the problems associated with the measurement of economies of scale, as will be explained below.

The key point that needs to be considered from the information displayed in Table 4 is whether those firms more orientated to trading in packaged olive oil were larger and required more capital than those more focused on exporting bulk olive oil. Unfortunately, the results presented in the table do not give a definitive answer. They show that the average exports per firm, the average capital per firm or any of the other proxies used for measuring firm size or capital requirements were substantially higher in Group I than in Group II. As the qualitative information suggested, this would indicate that both the minimum efficient scale and the capital requirements of those firms dealing with brand-name olive oil had to be higher than the rest.

Nevertheless, a closer look at the information presented in Table 4 suggests that size and capital requirements varied substantially within each group of firms. For example, in Group I, only 44% of the firms (i.e. 10 out of 23) had a size, as measured by total exports, equal to or above the Spanish average. This seems to suggest that the scale economies or capital requirements as entry deterrents in markets for packaged and brand-name olive oil has a more ambiguous than initially expected.

[Figure 4 about here]

This ambiguous role also emerges when firm size is compared to levels of concentration across individual markets. Using Spanish export data at firm level for the period 1930–34, Figure 4 correlates firm size versus firm concentration in 43 individual foreign markets. Firm size is proxied by the total average exports of those firms trading with the selected individual market, while firm concentration refers to the four-firm concentration ratio (C_4) of the Spanish exporters in the considered market. The figure speaks for itself. Size correlates positively with concentration. Its influence is far from negligible. In spite of this, the coefficient of determination suggests that firm size explained much less of the concentration levels, and therefore of entry barriers in the international markets for olive oil, than product differentiation did (Figure 4, $R^2 = 0.31$, Figure 3, $R^2 = 0.63$). This is true both when all the markets in the sample are included in the correlation, as in Figure 4, but also when the 14 largest markets of the sample are the only ones taken into account in order to control for the effect of market size. In this latter case, the coefficient of determination (R^2) is also quite low (0.38).

Certainly, the results of these simple bivariate correlations need to be treated with caution. In the exercise, the variable used for measuring firm size has been total average exports per firm operating in the considered market. This indicator biases the results of the correlations in at least two different ways: first, it is very sensitive to the number (and size) of the firms operating in the selected markets;

second, it is very insensitive to the share that these firms have achieved in the individual market. Because of this, total average exports per firm operating in the considered market does not seem to be a very good indicator of the minimum efficient scale of the firms in each of the 43 markets included in the sample. In the light of these caveats, other proxies for scale economies might be constructed such as those suggested by Florence (1933) or Comanor and Wilson (1967). Nevertheless, these proxies are not free from problems either.[15]

To summarise, the available evidence presented above is still fragmentary. The measurement of economies of scale and minimum efficient scale also presents several shortcomings. Consequently, it is difficult to offer conclusive answers. The impression is that both economies of scale and some minimal capital requirements had to be achieved in order to produce and commercialise brand-name olive oil even though the threshold level of both has been impossible to be established. Firm size and capital requirement probably have had some influence on concentration and, consequently, on entry barriers. However, judging from the available evidence, this influence seems less in comparison to product differentiation. In fact, a significant number of small firms populated the Latin American markets, although it is true that they generally accounted for a small share of the market.

Economies of agglomeration and absolute cost advantages of incumbent firms

For the firms that apparently lacked a minimum efficient scale in the early 1930s, other factors might have eased their entry (and survival) in the American markets for packaged olive oil. Economies of agglomeration might be one of these factors. Indeed, two-thirds of Spanish firms in the early 1930s whose main export region was Latin America were located in (and exported from) the coastal cities of Barcelona (Catalonia) and, to a lesser extent, Seville (Andalusia) (Table 5). This geographic concentration probably arose due to the existence of agglomeration economies linked to commercial services and trade flows. In these two cities, olive oil export firms could have taken advantage of both the existing supply of commercial services and the intensity of trade flows with Latin America. Whether economies of agglomeration increased (or reduced) barriers to entry into markets for brand-name olive oil is harder to establish.

[Table 5 about here]

Besides agglomeration economies, another factor may explain why, in the early 1930s, firms that were small by Spanish standards were mostly orientated towards the American markets for packaged and brand-name olive oil. This factor has to do with the existence of absolute cost advantages of early movers, which was the third barrier to entry suggested in Bain's classic book. To start with, commercial experience seems to have played a role in penetrating American markets for brand-name olive oil. Both exporters and experts repeatedly argued that knowledge about consumers' tastes and the marketing of the product was essential in brand-name olive oil exports (e.g. Manjarrés, 1872, p. 155; AOE, May

[15] For a review of these and other measures of economies of scale, see, for example, Lyons (1980), Davies (1980), and Curry and George (1983).

1929, no. 5, p. 31). In general, this knowledge was only acquired after several years of commercial experience.

If experience was important to enter these markets, it could also be hypothesised that the costs of producing and exporting packaged olive oil substantially decreased as the experience of firms increased. First, exporters that entered these markets earlier could have acquired a deep knowledge about both consumers' tastes and the marketing of the product. Second, these early movers could have established solid commercial networks. Last, they could have become more efficient in producing and exporting brand-name olive oil. Consequently, incumbent firms might have enjoyed absolute cost advantages over potential entrants, which would have contributed to deter entry in the Americas.

Certainly, by 1930–34 a large share of the Spanish exporters dealing with packaged olive oil consisted of experienced firms. An inspection of the figures presented in Table 5 shows that by the early 1930s, Spanish early-movers intensively populated the group of Spanish firms whose main export region was Latin America (Group 1). Of the Spanish firms that belonged to this group, almost 80% had been set up prior to World War I; more than 60% had already begun to export to the Americas before 1914, whereas most of the other firms belonging to this group started to penetrate these markets during World War I.

This evidence could suggest that firms that entered the American markets earlier enjoyed absolute cost advantages over new entrants. However, it could also be concluded that the competitive advantage of many firms dealing with packaged olive oil was linked to the ability to create niche markets through product differentiation rather than to the capacity for decreasing costs. Therefore, at the present stage of research, it is very difficult to know whether and to what extent absolute cost advantages of incumbent firms deterred entry into the Americas.

An econometric test for explaining the influence of product differentiation as an entry barrier

Throughout this paper, it has been suggested that product differentiation may have played a crucial role in making entry barriers higher on the other side of the Atlantic than elsewhere. By contrast, the influence of scale economies and absolute cost advantages of established firms appears to have been more moderate. To this must be added that the evolution of markets contributed to the rise of entry barriers in the New World. After the end of World War I, as the American markets for olive oil matured, entry barriers associated with product differentiation appear to have been more apparent for potential entrants.

There is no doubt that only by means of econometric analysis can the role of the potential entry barriers be properly assessed. This kind of analysis would require reliable proxies for product differentiation, scale economies and costs at firm level. Indicators on the evolution of markets would also have to be taken into consideration. As stated before, it is unfortunate that the appropriate quantitative evidence is lacking for most of these variables, or at least for most of the variables more clearly identified as entry barriers by the literature on industrial organisation. The only exception refers to product differentiation since Spanish

export data on the size of the packages of the exported olive oil seem to be an appropriate proxy for measuring the intensity in the use of packaging, branding, and to a lesser extent, advertising in foreign markets.

With this evidence on the size of the packages, an econometric model is constructed in order to measure whether, and to what extent, product differentiation influenced concentration, and therefore, entry barriers. The econometric model employed here is estimated on the basis of cross-sectional data; it uses least squares and is very simple but useful for our purposes. The dependent variable is the level of Spanish exporting firms' concentration in a sample of 43 foreign markets for the period 1930–34. The data used to calculate concentration have been obtained from a sample of 58 Spanish exporting firms. Concentration is measured by the four-firm concentration ratio (C_4) and appears to be more appropriate for our purposes than the Hirschman–Herfindahl index.[16]

There are two independent variables. The first is the percentage of Spanish olive oil exported in small packages relative to total Spanish olive oil exports to each of the selected markets. This captures the existence of product differentiation. The second independent variable is market size as measured by the total amount of olive oil exported by the firms of the sample to each individual market. The data that make up the model are expressed in logarithms and have been previously transformed into index numbers (USA = 100).

[Table 6 about here]

Table 6 summarises the results of the estimation of the model. Weighted least squares are used in order to correct for the presence of cross-section heteroscedasticity. According to the applied tests (Jarque-Bera and White), the behaviour of the residuals is adequate. The adjusted R-squared is also acceptable and relatively high.[17] As far as the independent variables of the model are concerned, they also appear to behave as expected. The proxy used for export marketing techniques obtains the expected (positive) sign and is statistically significant at the 1% level. The magnitude of the coefficient is relatively low, or at least lower, than a priori one would expect. However, this coefficient is not that different from that obtained for the size of the foreign market. This is the other explanatory variable included in the model. As can be seen, the size of the foreign market also obtains the expected (negative) sign and is statistically significant at

[16] As the HHI overestimates the weight of the largest firms, it appears to be more appropriate to use this index when the purpose of the research is to measure the level of oligopoly in the market (see Hannah & Kay, 1977).

[17] The White test allows determining whether heteroscedasticity is present in the regression model. Heteroscedasticity refers to the presence of nonconstant error variance across observations, which violates an important assumption of the classical linear regression model. The Jarque-Bera test is used to establish whether or not the data in the regression model are from a normal distribution. In any case, the presence of both heteroscedasticity and no normal distribution bias the results and may lead to misleading conclusions. In our case, White's test indicates that the null hypothesis of no heteroscedasticity can be accepted at the 1% of significance level. On the other hand, the Jarque-Bera test indicates that the null hypothesis of normal distribution of the series can be accepted at the 10% level. The model has been replicated by using as a measure of concentration the HHI instead of the C_4 ratio. Unfortunately, the applied tests (White and Jarque-Bera) indicate the presence of cross-section heteroscedasticity and not normally residual distributed series, even though the coefficients of the equation for the independent variables have the expected sign and are statistically significant.

the 1% level.[18]

On the basis of these results, several conclusions may be raised. The first and most obvious is that a number of factors have influenced exporters' concentration in the international markets for olive oil. The size of the market was one of them. However, for the purpose of this section, it is worth pointing out that export marketing did not play a neutral role in concentration. On the contrary, the results of the model confirm that ceteris paribus foreign markets in which packaging, branding and advertising were used more intensively had a higher concentration of exporters, and therefore higher entry barriers. As previously stated, the Americas were the area of largest use of modern marketing techniques in olive oil. In consequence, it seems obvious to conclude that it was in the American markets where potential new entrants probably had to incur additional costs in order to achieve market penetration due to product differentiation.

This does not mean that entry barriers in American markets were impossible to surmount. This does not mean either that product differentiation was the only source of entry barrier on the other side of the Atlantic. It simply means that both the characteristics and the competitive conditions of the American markets may have influenced the final decision of olive oil exporting firms. This in turn may help to explain the likely deceleration of the entry process amongst the Mediterranean exporters of packaged olive oil that took place in the Americas after the end of World War I.

Conclusions

This article has explored the entry process and its determinants in the case of the Mediterranean exporters of packaged olive oil to the Americas during the 1880s and the 1930s. It has focused on arguing that as markets matured entry barriers became more apparent for potential entrants, and that this might have played an important role in explaining the dynamics of firms' entry in the Americas prior to World War II. By 1930–34, entry barriers were on average higher in the New than in the Old World. These differences in the height of entry barriers arose in part from product differentiation through packaging, branding and advertising. This finally contributed to the emergence of early-entrant advantages and the increase of entry barriers in the Americas. By around 1930, firms that had entered the markets on the other side of the Atlantic before World War I still accounted for a significant share of the exports of packaged olive oil sent to Argentina and the USA. Relative to product differentiation, the role played by economies of scale and absolute cost advantages as entry barriers seems of less importance, although a definitive answer cannot be given due to the lack of appropriate data as well as measurement problems.

These results have several implications. In the light of the existing literature on industrial organisation, they confirm that entry is attracted by market growth, but product differentiation may increase entry barriers over the long run. According to the results of the econometric model presented in this paper, product

[18] Exporters' concentration ratio remarkably varied across markets, but these variations were not enormous. This might help to explain the low levels of these coefficients.

differentiation (as measured by the type of package the product was traded) is a variable statistically significant in explaining levels of firms' concentration, and therefore entry barriers.

The findings of this article can also be discussed in the context of business history and, particularly, in the context of marketing and branding history. They have shown that in line with other markets for food and drinks, modern marketing also emerged in the international olive oil markets at the end of the nineteenth century. It has also made clear that, as in the case of other consumer goods, packaging, branding and advertising became essential factors in penetrating foreign markets, but also that the use of modern marketing techniques could benefit early movers and could deter entry. As pointed out by other scholars, some of the evidence presented in this article has also shown that early movers needed to continue investing in advertising to preserve their initial advantages as early entrants. Finally, the preceding paragraphs have suggested that market evolution had a role to play in firms' entry processes.

In the framework of the international markets for olive oil, the results of this article lead to another interesting conclusion. In the American markets for packaged and brand-name olive oil, early movers could probably retain higher market shares than late entrants which coped with higher entry barriers as the markets became more mature. Italian export firms penetrated earlier than the Spanish ones in the largest American markets for olive oil. This probably had long-term consequences, for example by giving Italian firms a certain market power as first entrants. By the late 1920s, the Italian firms still accounted for around 60% of the total American olive oil imports; the Spanish share was around 30%.

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Tables

Table 1. The better-known brands (and firms) for olive oil in Buenos Aires (Argentina) according to both Spanish and Italian consular information, c. 1887–c. 1913.

c. 1887	c. 1900	c. 1913
Panel 1. French brands (and firms)		
. Cheval (n.d.) . Plagniol (James Plagniol) . Puget (Adolphe Puget)	. Plagniol (James Plagniol) . Puget (Adolphe Puget)	. Cordon Bleau (S. Saugues & Co.) . Plagniol (James Plagniol) . Puget (Adolphe Puget) . Nini (n.d.) . Saugues (S. Saugues & Co.)
Panel 2. Italian brands (and firms)*		
. Ardissone (Fratelli Ardissone fu O.B. [?]) . Biancheri (n.d.) . Muratorio n.1 (Carlo Muratorio [?]) . Ottone (Giuseppe Ottone & Figli) . Salvo (n.d.)	. Extra Lucca n.1 (n.d.) . Extra Lucca D.O. (n.d.) . Leveratto & Raggio [?] (Leveratto & Hermanos Raggio) . Lucca Costa (n.d.) . Lucca Perla (n.d.) . T. Moro (Tommaso Moro & Figli) . Tixi Extra Olivo (A. Canepa & Co.)	. Boccanegra (Tommaso Moro & Figli) . Costa [?] (Francesco Costa & Figli) . Extra Lucca (Luigi Parpaglioni) . Helvetia (n.d.) . Lavagnino (n.d.) . Leone (Carlo Muratorio fu GB) . Leveratto (L. Leveratto) . T. Moro (Tommaso Moro & Figli) . P. Moro (Pio Moro) . C. Muratorio (Carlo Muratorio fu GB) . T. Muratorio (Tommaso Muratorio) . Ottone (Giuseppe Ottone & Figli) . Raggio (L Raggio Hermanos) . Tixi (A. Canepa & Co.)
Panel 3. Spanish brands (and firms)		
. Porcar y Tió (Manuel Porcar y Tió) . Quinzà(Quinzà Hermanos) . Conill Hermanos (Conill Hermanos) . Sensat (Gerardo Sensat e Hijos)	. Porcar y Tió (Manuel Porcar y Tió) . Conill Hermanos A (Conill Hermanos) . Sensat (Gerardo Sensat e Hijos) . Martí(n.d.)	. Bau (José Bau) . Conill Hermanos A (Conill Hermanos) . D. Gómez (Diego Gómez) . Lorenzo (A. Lorenzo) . Luca de Tena (Hijos de Luca de Tena) . Minerva (n.d.) . Porcar y Tió(Manuel Porcar y Tió) . La Reina (n.d.) . Salat (José Salat e Hijos) . Saturno (José Puigdollers [?]) . Sensat (Gerardo Sensat e Hijos)

Notes: *Brands owned by Argentinean firms of Italian origin are included; Co., Company; n.d., no data available.
Source: Ramon Muñoz (2010).

Table 2. The Italian and Spanish leading exporters of packaged olive oil to Argentina and the USA c. 1930.

Firms	Location (city, region, country)	Origins	Argentina		USA	
			Share*	Rank	Share*	Rank
Tommaso Moro & Figli	Genoa (Liguria-IT)	Before 1888	19	1	2 – 4	7
Escoffier Guidi**	Sanremo (Liguria-IT)	c. 1834	8	2	3 – 6	5
Giorgio Ottone & Figli	Genoa (Liguria-IT)	Before 1887	7	3	n.d.	n.d.
Fratelli Berio	Oneglia (Liguria-IT)	1870	7	4	n.d.	n.d.
Olivarera del Mediterráneo	n.d.	n.d.	6	5	n.d.	n.d.
P. Sasso & Figli**	Oneglia (Liguria-IT)	c. 1860	6	6	3 – 6	6
Hijos de Ybarra	Seville (Andalusia-SP)	1842	5	6	4 – 10	4
Pietro Bresciano fu Pietro	Imperia (Liguria-IT)	1850	4	8	n.d.	n.d.
ASTOR	n.d.	n.d.	3	9	n.d.	n.d.
Aceites Bau	Tortosa (Catalonia-SP)	1842	3	10	0 – 1	n.d.
Joseph Lupi	Porto Maurizio (Liguria-IT)	1880	3	11	n.d.	n.d.
Miguel G. Longoria & Co.	Seville (Andalusia-SP)	c. 1904	3	12	0 – 1	n.d.
Pietro Salvo	Porto Maurizio (Liguria-IT)	n.d.	2	13	2 – 4	8
Giacomo Costa fu Andrea	Genoa (Liguria-IT)	1854	2	14	7 – 14	2
Francesco Bertolli	Lucca (Tuscany-IT)	1865	1	15	7 – 14	1
Frugone & Preve	Genoa (Liguria-IT)	1856	1	16	n.d.	n.d.
SALOV (brands Filippo Berio and Calisto Francesconi)**	Lucca (Tuscany-IT)	1867/1919	1	17	6 – 12	3
Hijos de Luca de Tena	Seville (Andalusia-SP)	1840	1	18	1 – 2	n.d.
Vincenzo Salvo	Bordighera (Liguria-IT)	1897	1	19	n.d.	n.d.
G. Sensat, Hijos	Barcelona (Catalonia-SP)	1878	1	20	1 – 2	n.d.
Hijos de José Sabater	Reus (Catalonia-SP)	1824	1	21	n.d.	n.d.
Carbonell & Co.	Córdoba (Andalusia-SP)	1866	0	22	1 – 3	9
Carlo Daneri & Figlio	Porto Maurizio (Liguria-IT)	1830	0	23	1 – 2	n.d.

Notes: In 1923, Porto Maurizio and Oneglia were unified in a single municipality. The city took the name of Imperia; * percentage of the total imports of packaged olive oil. For the case of the United States, the table shows the estimated lower and upper bounds; ** Escoffier Guidi was first established in Nice, but moved to Sanremo after the Italian Unification. P. Sasso & Figli was the name that adopted Agostino Novaro's firm in 1899 when he moved from Diano Marina to Oneglia. SALOV is the acronym for Società Azionaria Lucchese Olii e Vini, which was set up in 1919 by several growers, producers and exporters from Lucca. The year 1867 was when Filippo Berio olive oil began to be sold in Italy. IT = Italy; SP = Spain; Co., Company; n.d., no data available.

Sources: Text and Notes.

Table 3. Levels of firm concentration of the Spanish exports by regions, 1930–34.

	No. of countries include	Individual countries (unweighted average)		Regional and continental aggregation		Olive oil exported by the Spanish firms (metric tons)	
	(I)	C_4 (II)	HHI (III)	C_4 (IV)	HHI (V)	Total (VI)	Per market (VII)
North	2	72.3	0.168	54.4	0.097	13,171	6,585
Central/Antilles	10	85.8	0.399	60.2	0.114	9,827	983
South	10	85.0	0.292	66.7	0.134	18,322	1,832
Total America	22	80.9	0.329	47.9	0.075	41,320	1,878
Scandinavia	4	83.0	0.291	49.6	0.095	2,681	670
Others North	9	88.7	0.444	54.5	0.108	3,628	403
South	3	56.2	0.109	46.1	0.079	15,660	5,220
Total Europe	16	81.2	0.343	38.7	0.060	21,969	1,373
Others	5	88.2	0.354	56.2	0.095	348	70
Total	43	83.5	0.337	36.9	0.053	63,637	1,480

Sources: Figure 1; text; *Estadística(s) del Comercio Exterior de España*, 1930–34.

Table 4. Size and capital requirements of 61 Spanish olive oil export firms grouped according to the geographical destination of their exports, 1930–34.

	Groups			
Proxies	I (Latin America)	II (Other Regions)	All sample	Ratio (I/II)
1. Average exports per firm, 1930–34 ('000 kg)	1559	832	1106	1.9
% of firms with exports equal to or above the Spanish average	44	26	33	1.7
% of firms with exports equal to or above the group average	39	32	34	1.2
2. Average capacity of refining per firm, c. 1935 ('00s kg per 24 hours)	300	245	274	1.2
% of firms possessing their own refining plants	57	32	39	1.8
% of firms with a capacity equal to or above the Spanish average	54	42	48	1.3
% of firms with a capacity equal to or above the group average	46	42	44	1.1
3. Average nominal capital per firm c. 1935 ('000 pesetas)*	3252	2143	2655	1.5
% of firms with capital equal to or above the Spanish average	37	29	33	1.3
% of firms with capital equal to or above the group average	21	29	25	0.7

Notes: *It only includes information for 40 firms.
Sources: Ramon Muñoz (2000b, pp. 129–132, 2000c, pp. 185–200).

Table 5. Location and commercial experience of 61 Spanish olive oil export firms grouped according to the geographical destination of their exports, 1930–34 (as a percentage of the firms belonging to the group).

	Groups			
Proxies and indicators	I (Latin America)	II (Other regions)	All sample	Ratio (I/II)
1. Proxies for economies of agglomeration (geographical location of the firm's head office)				
Firms from North-eastern Spain	52	37	43	1.4
Firms from Central and Southern Spain	48	63	57	0.8
Firms from Barcelona (North-east)	43	11	23	4.1
Firms from Seville (South)	22	5	11	4.1
2. Proxies for commercial experience and entry into foreign markets				
Firms set up prior to 1900*	57	28	40	2.0
Firms set up prior to 1914*	78	48	62	1.6
Firms exporting olive oil prior to 1900	39	13	23	3.0
Firms exporting olive oil prior to 1914	61	37	46	1.7
Firms that entered Latin America prior to 1914	61	8	28	7.7

Notes: *Only includes information for 52 firms.
Source: Table 4.

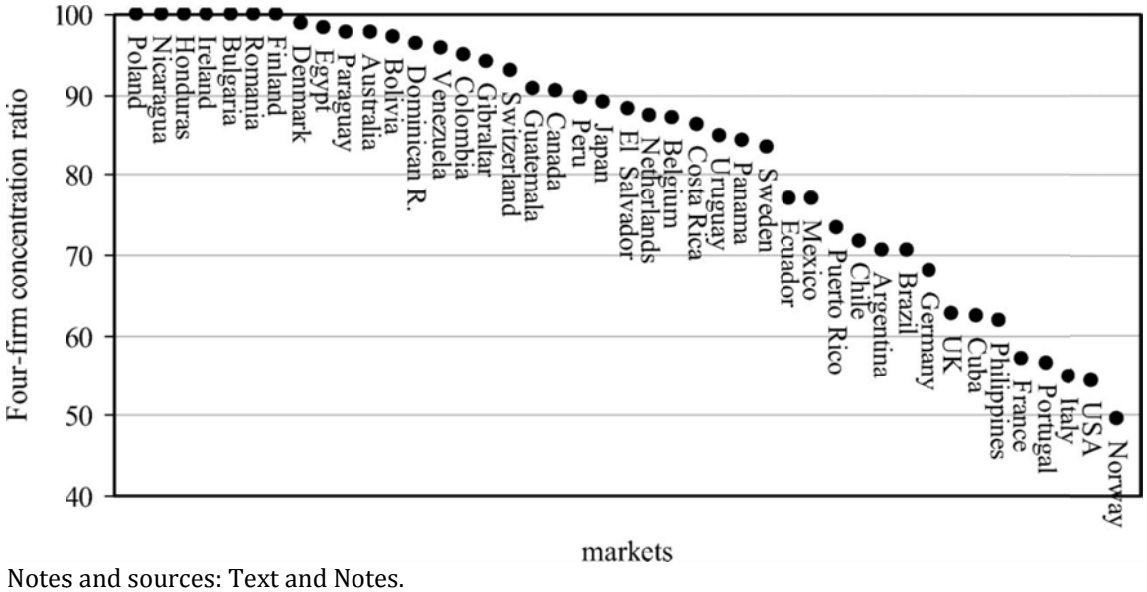
Table 6. Determinants of Spanish exporting firms' concentration (C_4) by foreign markets, 1930–34.

Independent variables	Coefficients	t-statistic
Constant	4.781***	(90.959)
Modern marketing (percentage of olive oil exported in small packages)	0.044***	(3.637)
Size (olive oil exported by the firms of the sample)	-0.055***	(-8.230)
Adjusted R2	0.694	
Jarque-Bera test	5.926*	
White test	4.636***	
Included observations	43	

Notes: ***1% significance level; **5% significance level; *10% significance level.
Sources: Text, Notes and Table 3.

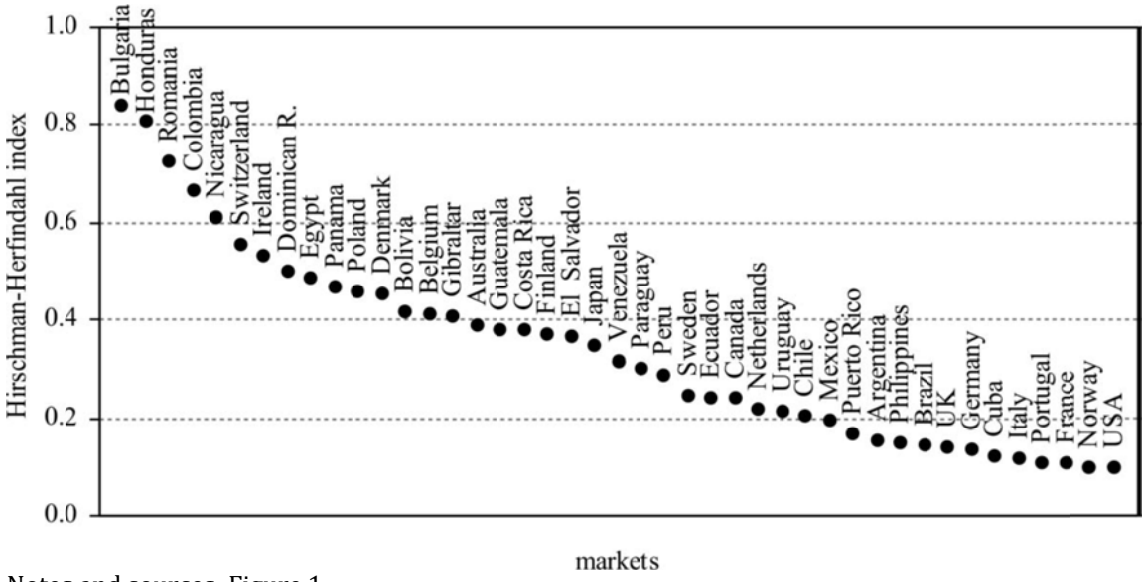
Figures

Figure 1. Four-firm concentration ratios of the Spanish exporting firms by foreign markets, 1930–34.



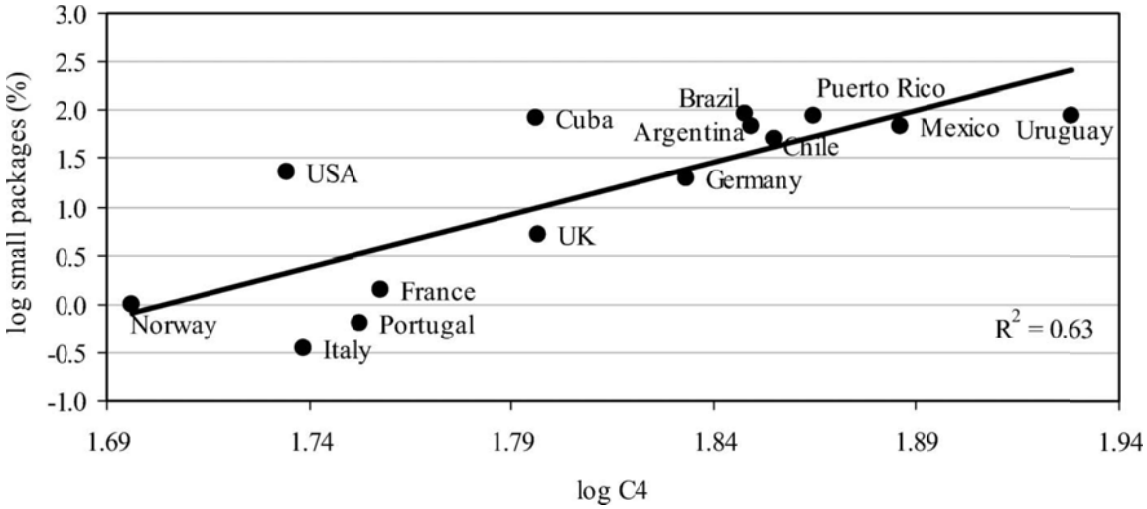
Notes and sources: Text and Notes.

Figure 2. Hirschman–Herfindahl index of the Spanish exporting firms by foreign markets, 1930–34.



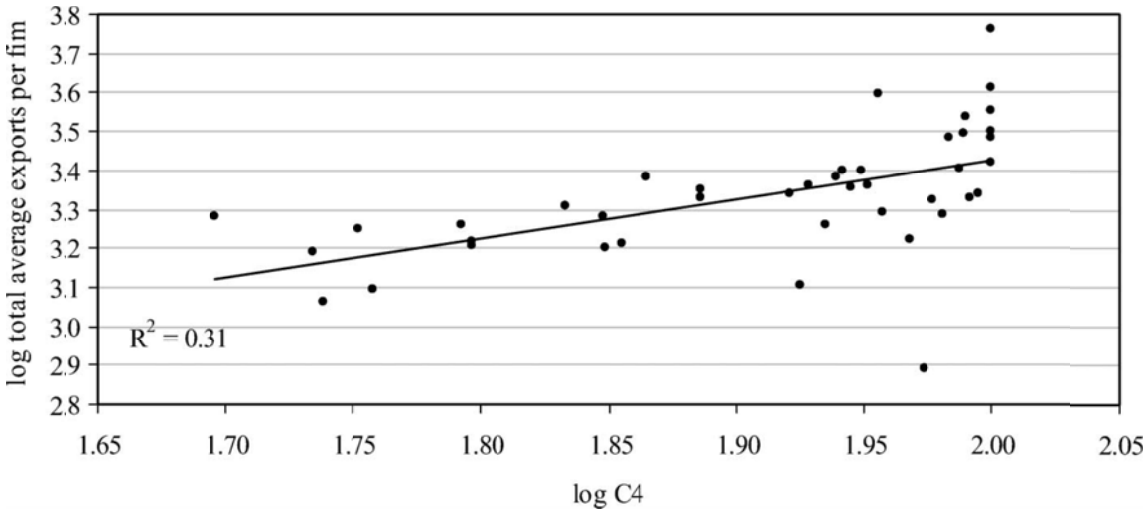
Notes and sources: Figure 1.

Figure 3. Spanish exporters' concentration versus modern marketing in the 14 largest foreign markets for Spanish olive oil, 1930–34.



Notes and sources: Table 3.

Figure 4. Spanish exporters' concentration versus firm size in foreign markets for the Spanish olive oil, 1930–34.



Notes and sources: Table 3.