COOPERATION AND COOPERATIVES IN SOUTHERN EUROPEAN WINE PRODUCTION:
THE NATURE OF SUCCESSFUL INSTITUTIONAL INNOVATION, 1880-1950

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Abstract

The paper examines the nature of cooperation and the establishment of formal wine making cooperatives amongst wine producers in three countries - Italy, France and Spain. High monitoring costs associated with wage labour, and increasing economies of scale in wine making encouraged large and small growers to cooperate in a large number of areas. The collapse in wine prices in the early twentieth century stimulated widespread interest in wine making cooperatives. Yet despite the apparent economic advantages of membership for smaller producers, the diffusion of cooperatives varied significantly between, and within, these countries. Access to long term capital, the role of church and political parties in encouraging producer cooperatives, the availability of alternative wine making facilities, and the degree of mobility of small growers, are all shown to be important.

Keywords: viticulture, agrarian cooperation, cooperatives.

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Cooperation and cooperatives in southern European wine production: the nature of successful institutional innovation 1880-1950.

Although informal cooperation amongst farmers is a feature of traditional societies, the development of cooperatives is relatively new, with few existing in European agriculture prior to the twentieth century. Furthermore, before the Second World War the relative importance of cooperatives varied greatly, both between countries and within the agricultural sector of individual countries. This paper looks first at the nature of traditional cooperation amongst wine producers in a rapidly changing economic environment, and then the establishment of formal wine making cooperatives in three producing countries - Italy, France and Spain. In the first section I examine a number of the major problems facing producers between 1880 and 1950, namely the appearance of new vine diseases, the persistence of weak wine prices for long periods, and rising wage costs. The second section shows how technological change gave producers opportunities to adapt to these problems. Some growers used the new biological technologies to produce significant increases in yields, whilst others tried to mechanize some of the tasks found in viticulture. The third section argues that cooperation amongst wine producers was very important in their attempts to remain competitive. Cooperation took place not just among small producers, but also between large and small growers. I suggest that this was because of two reasons. First, high monitoring costs associated with viticulture and rising wages provided incentives for larger farmers to establish formal and informal contracts with those growers who did not have enough land to employ fully their families. By contrast, the increasing economies of scale associated with wine making encouraged producers of small quantities of grapes to arrive at agreements with larger growers with surplus processing and storage capacity to make them into wine. The fourth section shows how the growing economies of scale in wine production and marketing, together with the possibilities of improving wine quality, encouraged small producers in the early twentieth century to establish wine making cooperatives. The final section considers why, despite the apparent economic advantages of membership for smaller producers, the diffusion of cooperatives varied significantly between, and within, these three countries. Access to long term cheap capital, the role of church and political parties in encouraging producer cooperatives, the availability or not of alternative wine making facilities, and the degree of mobility of small growers, are shown to be important. By the end of our period,

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cooperatives were spreading rapidly into new areas, in part because some of these obstacles had been removed, but also because the state saw in cooperatives a useful instrument to intervene in the domestic wine market.

1. Long run changes in prosperity.

For a number of reasons, it is more difficult to compare the price of wine across geographic regions, and over time, than for most other agricultural products. First, consumers were willing to pay very different prices according to the nature of wine. For example, a liter of ordinary French table wine in London in 1873 cost just 4 per cent of that of a primière cru, a very similar price difference to that found in Bordeaux itself. Major price differences encouraged producers and wine merchants to try and imitate expensive wines, leading to popular brands being widely copied. The problem of product differentiation was made worse by the fact that mixing wines was frequent. Many famous wines, such as Port, Sherry, Madeira, or Marsala, were strengthened by the addition of alcohol. But mixing ordinary table wines (coupage) was also widespread, both because stronger wines kept better, and for fiscal reasons (see below). Second, the quality of a particular wine changed over time. As wine makers frequently lacked a proper understanding of fermentation and maturing, and had under-equipped and poor wine making facilities, the vast majority of wines had to be consumed within the year of their production, if they were not to suffer serious changes in their composition. Third, especially prior to the railways, the bulky nature of wine limited its trade to those regions close to good water communications. As a result, most wines were traditionally drunk locally, leading to large price differences between regions. Fourth, even on the same farm there was often a large number of grape varieties, which might produce very different wines. Finally, because wine was considered as a non-essential beverage for consumers by governments, it was usually subject to relative high local taxes - consumo in Spain, octroi in France, dazio consumo in Italy.

Given these difficulties, wines were often priced according to their alcoholic strength. In Graph 1, the French and Italian figures are national prices, whereas those for Spain come from our joint research, and for his comments on this text.

2 The Wine Trade Review, cited in Pan-Montojo and Simpson, forthcoming, and Roudié, 1994, p.36, who notes that a leading Medoc sold for around 22 times that of a Saint-Macaire, Blaye or Bourg in 1840.
3 For one example, that of sherry, see Simpson, 1985b, pp.168-73.
4 Mixing high strength Algerian wines with their own lower strength wines also allowed producers in the Midi to raise their yields.
5 All were normally mixed together during fermentation, but it meant that neighbouring farms might produce
from a specialized wine producing area in Cataluña, and are less representative of the country as a whole. Cycles of high and low prices are easily visible for all three countries, although the depth and starting points often varied. Prices increased everywhere until the mid 1880s, when they began a long decline, bottoming out during the first decade of the twentieth century. The period of high prices witnessed a large growth in the production of artificial wines, often made from cheap "industrial" alcohol, especially from sugar beet. The low prices of the first decade of the twentieth century witnessed the first serious attempts to limit the production of these "fraudulent" wines. Between 1901 and 1907 wine producers in the Languedoc in southern France sold their wines at cost price or at a loss during five of the seven years, and the demonstration in Montpellier in June 1907 attracted over half a million protesters.\(^6\) During the First World War, prices recovered for a few years, although growers also faced increasing costs and smaller harvests, with output falling 18 per cent in 1915-9 compared to 1910-14 in France, and 16 per cent in Italy.\(^7\) As output recovered in the early 1920s, prices weakened once more. The situation worsened dramatically in the early 1930s, when France was forced to introduce legislation to restrict further planting, tax producers who had very high yields, and even try to ban the planting of a number of vine varieties which were responsible for excessively large yields of poor quality wine. During the Second World War the combined shortages of labor and chemicals reappeared once more, and output fell which allowed prices to recover. However, because many of the 1930s restrictions had been relaxed during the war years, the early 1950s saw once more overproduction, and low wine prices.

On the demand side, although most European wines in the mid nineteenth century were drunk locally, quality wines and spirits had accounted for a significant proportion of European trade in the Middle Ages and the Early Modern Period. This trade had been a major factor in stimulating changes in local production methods and improving product quality. By contrast, the period under discussion here had two very different features: first, the wine trade switched from being one of predominantly high quality wines to one of table wines, and second, from the late 1890s, the traditional major exporters, namely France, Italy and Spain, saw their markets declined in absolute terms.

These changes in the international wine market can be explained by disease,

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\(^7\) In Spain, which was recovering from phylloxera, output increased by a third. The 1915 harvest everywhere was especially small on account of climatic conditions and the lack of chemicals for growers to protect their
especially phylloxera, and the growth in urban demand for cheap wines in France. Phylloxera was caused by an aphid which was transported to Europe from the New World, where many vines were immune to it. The speed of infection varied significantly within each country, but in time would destroy almost all of Europe’s original vines. The remedy was to replant using American vines as rootstock, and then graft European varieties. As French domestic production slumped from its peak of 83.8 million hectoliters after the exceptional harvest of 1875 (the equivalent of 219 liters per person net of foreign trade), to a low of 23.2 million in 1889, rising prices encouraged growers elsewhere to increase output. The result was that between 1880 and 1892 France imported the equivalent of a quarter of its own wine consumption, primarily from Spain and, to a lesser extent, Italy.\(^8\) Even after the recovery of its domestic production, world trade remained dominated by French imports of cheap, strong wines used to blend with domestic ones.\(^9\) But the wine boom for Spain and Italy did not last, as France restricted imports from both countries, and turned instead to its colonies, especially Algeria. Algerian wine production increased from an annual average of 0.6 million hectoliters in 1880-4 to 7.9 million in 1909-13, reaching 15.6 millions by 1950-4. Most of this production was exported, and almost all to France.\(^10\) As Table 1 below suggests, the combined exports from France, Italy and Spain declined, both in relative and absolute terms over the period 1880-1950.

The decline in export opportunities implied that wine producers in southern Europe were increasingly dependent on their domestic markets for sales, where demand was primarily for table wines. Thus in Spain for example, ordinary table wine accounted for 94 per cent of output, and "quality" and sparkling wines made up less than 2 per cent.\(^11\) Unfortunately, income elasticity for wine was low, at least in the early twentieth century. Indeed, in terms of quantity, all time per capita consumption peaked in 1920-4 in France at 168 liters/person, in 1906-13 in Italy at 128 liters/person, and 1920-4 in Spain at 96 liters/person.\(^12\) By the end of the period under discussion, demand was being driven primarily by population growth.

The second major feature that influenced growers’ profitability in this period was the vines against mildew.

\(^{8}\) Production averaged 29.5 million hectoliters, exports 2.4 million, imports 9.7 million, and consumption 36.8 million. Annuaire Statistique 1933, pp.179-80.

\(^{9}\) See Pan-Montojo and Simpson, forthcoming.

\(^{10}\) For example, in 1925-9, average production was 11.1 million hectoliters, of which 8.1 million were exported, and 97.6 per cent of this figure went to France. Ferrara, 1931, pp.114-5.

\(^{11}\) Liquors accounted for most of the rest. Ministerio de Agricultura, 1933, anuario 1932, pp.128-9.
rise in wages, especially from the turn of the twentieth century. Rising wages affected all aspects of agriculture, but viticulture was more labor intensive than most, and the possibilities of introducing labor saving technologies limited. However, once again, we can only show the general trends facing producers. In part this was because the use of wage labor was rare in many areas of viticulture, as we shall see. A second problem, and more serious, is that wages varied significantly during the year, both in response to the nature of the agricultural task, and to the opportunity cost of labor. Yet there is no doubting the long term trends in wages. Whereas in France, agricultural nominal wages increased by perhaps 20 per cent over the last quarter of the nineteenth century, similar increases were much more localized in both Italy and Spain. More relevant perhaps is that for wine producers everywhere, any growth in wage costs was more than offset by the buoyant nature of wine prices. This situation changed significantly from the turn of the twentieth century, when producers were caught between rising wages, and falling wine prices (Table 2). Although in the short term, wine prices might rise more quickly than wages, such as during the First World War, in the long run labor costs increased faster. By 1928 a day's wage in France could have bought 54 per cent more wine than it had done in 1873, 106 per cent in Italy, and 162 per cent more in Spain. This change clearly benefited consumers, but presented a sever challenge both to large producers using wage labor, and smaller ones working the vines with family labor.

2. The response of producers to low prices and rising costs.

Vines were cultivated under such a wide variety of conditions, that to attempt to describe a "typical" vineyard is impossible. However, the twin problems of low wine prices and rising wage costs affected directly, or indirectly, all producers. So too did vine diseases, not just phylloxera, but also mildew and black rot, which were particularly virulent with the new American vines. Traditional pre-phylloxera viticulture had consisted essentially of two inputs: land, often marginal for other crops, and labor. Labor requirements involved a number of basic skills, especially pruning, but these could be learnt easily enough with informal education in the vineyard or village. New vines were planted either by layering (provignage), which involved the burying a cane from an established vine to the site where the new plant was required, or by planting directly a cutting. Entry costs of traditional viticulture were low.

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12 Annuaire statistique 1933, p. 463. Per capita consumption was lower after the Second World War.
13 Even those growers who paid no wages, but used family labor instead, would see their living standards seriously eroded unless they cut costs.
14 Marescalchi (1924, pp.5-12), for example, found such significant differences in the average cost of producing
Phylloxera and other diseases raised these costs in a number of ways. First, chemicals accounted for around a fifth of annual cultivation costs by the 1920s.\textsuperscript{15} Second a more scientific approach was required to determine the best rootstock and scion to be grafted for each vineyard, and replanting saw an increase in the use of non-farm inputs. Finally, although the new vines might produce higher yields, they required a better preparation of the land before planting, and the greater use of fertilizers.

How did producers of grapes, or manufactures of wine, react to these long run changes in wine prices, labor costs, and vine disease? We can divide their responses into four main areas. First, by switching out of vines into more profitable crops. Second, through unit cost reductions in grape production in the form of labor saving technologies. Third, by increasing yields through recourse to new biological technologies. Finally, by exploiting the growing economies of scale in wine making and its marketing. Two other important areas, namely attempts to improve product quality and government intervention in wine markets to support prices are also considered briefly. We leave to the following section a more detailed discussion of growers' decision making.

Lower wine prices and rising costs, especially after phylloxera, encouraged some farmers to look for alternative crops. Yet in general, winegrowers were loath to uproot vines before their productive life had ended, for a number of reasons. First, the high costs of planting had already been paid for; second, the land was usually not very productive for other crops; and finally, because viticulture provided significantly more employment on a small plot of unirrigated land than most other crops. Although the area of vines in France peaked in the pre-phylloxera period at about 2.4 million hectares in the mid 1870s, the area then fell only slowly from 1.7 million hectares in 1900 to 1.4 million by the early 1950s. However, as Table 3 suggests, if Algeria is taken as an economic extension of France, then the joint area remains very stable over the first half of the twentieth century. Elsewhere, the total area of vines in Italy remained at around 4.0 million hectares, the equivalent of very roughly 1.8 million hectares when the area of vines in mixed cultivation is converted into specialized viticulture, and in Spain, the area fluctuated around 1.4 million hectares between 1900 and 1950.\textsuperscript{16} This stability in the area of vines, together with the decline in wine prices, attests to the capacity of producers to adapt, although increasingly in the 1930s and 1950s, with the

\textsuperscript{15} The exact amount naturally varies significantly between vineyards. A figure of 18 per cent was given for Tarragona (Spain) in 1921. Instituto de Reformas Sociales, 1923, pp.161-74.

\textsuperscript{16} The area of mixed cultivation is converted to specialised crops by dividing it by 3.6, a coefficient given in
need of the state to help distill surplus production.

Attempts at labor saving can be divided into three main areas: the introduction of new energy forms in the vineyards, the use of mechanical sprays, and the introduction of new hand instruments which simplified both harvesting and pruning operations. Although important advances were to be found in a few areas prior to the 1880s, the combination of phylloxera, low wine prices and rising real wages saw an important diffusion in their use with the replanting of vineyards. We shall consider each briefly in turn.

The ease by which vines can be damaged implies that considerable care is needed in their cultivation. Until very recently, there was no mechanical alternative to the labor intensive tasks of harvesting or pruning. By contrast, growers in our period faced a choice of techniques in the cultivation of vines. The use of animal drawn ploughs was certainly not new, but the high density of vines in some regions, the unorganized nature by which they had been planted, and the unscientific nature of pruning implied that a considerable amount of work had to be done by hand. The need to replant after phylloxera allowed growers to reorganize planting with a view to cutting annual labor inputs. The planting of vines in straight lines, a decline in the number of plants per hectare, and the use of wire trellises, all facilitated the greater use of ploughs in the cultivation between the rows. The potential labor saved was considerable, and in those areas which could not cut costs in this way because of the steep gradient of the land, such as Priorato in Spain, were not replanted.

The post-phylloxera vines were more susceptible to disease, especially mildew and black rot, requiring the use of chemicals. The development of sprays helped keep the rise in costs in check, but so too did row planting, which allowed workers to move more easily amongst the vines and control better the quantity of chemicals used.

Another possibility was for growers to increase output rather than cut costs, and here two alternatives presented themselves: to improve quality, and hopefully the price the grower received for the wine, or take advantage of rapid advances in biological and chemical technologies, and select the most productive vines for a particular vineyard. One major obstacle for producers of fine wines was the lack of control they had over the wine after it left their farms. Fine wines might well bring high prices, but these in turn encouraged imitators, and consumers found it difficult to distinguish between different products. One solution to this problem was the appellation contrôlée (AOC), which in France in the 1930s tried to define wines by geographic area, type of grapes used, alcoholic strength, and restricted

B'OIV, 195...., and used throughout this paper.
production practices some considered undesirable. By the early 1950s, about 10 per cent of all French wines were AOC, with smaller percentages in Italy and Spain.\(^{17}\) For the majority of producers however, higher prices were not in general sufficient to offset the lower yields associated with quality wines, or the significantly higher costs found in both the vineyards and the maturing of wine. Instead, grape production was one of the first crops where growers successfully turned to science to increase output significantly, and also one of the first in suffering persistent problems of overproduction as a consequence.

Wine yields are a poor indicator of technical progress, because in areas of quality production they tend to be low, and because they vary significantly over the life of the vine. Furthermore, in those areas such as Italy where intercropping was important, they might not even be the principal crop. A final problem is that the planting of vine varieties which produced very high yields of poor quality wine were banned in France and Italy, briefly in the 1930s, and again in the 1950s. However, Table 3 sheds important light on the experience of four countries. In the first instance, we see that yields in France and Algeria were higher than the other two countries and, in the case of the metropolis, had a tendency to grow over the period. Even before phylloxera, there had been a move in the Languedoc to expand wine production on the fertile plains which increased yields, but at the cost of a decline in quality. The appearance of phylloxera encouraged further this process, but it also stimulated a great deal of scientific research into vines and wine production. In particular, the scientific community became split between those that believed growers should use European vines grafted onto American rootstock, and those who preferred using “hybrids” or "direct producers".\(^{18}\) For quality wine producers, there was no debate, as quality was only achieved by grafting. However, most growers in France did not produce quality wines, and the attraction of hybrids was that they produced large quantities of wine, even though it was often only fit for blending. By 1929 one seventh of vines were hybrids, a figure which had grown to almost a fifth and about 300,000 hectares by the early 1940s. Despite new planting restrictions, the figure had reached 31 per cent of the total area of 1.3 million hectares in 1958, and 42 per cent of wine production.\(^{19}\) Almost as important as higher yields, hybrids required far less care and chemicals than the grafted \textit{vinifera} vines.\(^{20}\) Therefore, as Table 3

\(^{17}\) Lachiver, 1988, p.584. Not too much should be read into these figures however. Quality wines were, by their very nature, exclusive products. A number of AOCs were made far too large, such as Bordeaux or Chianti, and it was necessary for small groups of producers within these regions to establish other, more limited appellations.

\(^{18}\) “Hybrids” were vines planted directly, which needed no grafting.

\(^{19}\) Paul, 1996, pp.102 and 105, where the debate over the introduction of hybrids is fully covered.

\(^{20}\) Ibid.,p.100.
suggests, many French and Algerian producers sought to overcome low wine prices and increasing unit costs by maximizing output per hectare.

In Italy, hybrids were introduced early in the north and center of the country, but legislation in the 1930s halted their progress, and one report in the late 1940s, whilst unable to suggest an area of cultivation, claimed that they did not "present a serious threat to our oenology". Instead, growers in Italy intercropped on a large scale. In 1913, for example, 76 per cent of the North's vines were intercropped, 85 per cent of vines in the Center, but only in the drier South and Islands did it fall to 12 per cent.

Finally in Spain, the dry climate made the use of hybrids rare, yields were significantly lower that in the other countries, and growers in general were unable to intercrop. Instead, whereas in La Mancha growers competed successfully by taking low density: low cost viticulture to an extreme, those in more traditional areas of production, such as Cataluña, were less successful either at reducing production costs (as in La Mancha) or increasing yields significantly (as in the Midi).

To complement these change in the vineyards, there were changes in wine making facilities. Traditional wine making was simple, but labor intensive. In Italy and Spain, for example, grapes were still crushed by treading in many wine districts at the beginning of the twentieth century. A worker, during a hard day trod between 4 and 6 tons of grapes, producing roughly 25-40 hectoliters of wine. Not only was productivity low, but this labor intensive task coincided with the peak time of employment in the vineyard when labor was scarce. This fact facilitated the spread of cylindrical crushers in the larger vineyards from the late nineteenth century. Productivity improved with Marcilla Arrazola citing a small model, worked by two men, processing 2.2 tons of grapes an hour, or larger, engine powered models, between 5 and 10 tons. A characteristic feature of the period was that it was in areas of cheaper wines which were at the forefront of technological change. Producers of quality wines were slow to change, in this case because they feared that mechanical crushers would ruin quality.

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22 MAIC, 1914.
25 For Spain, see Elias de Molins, 1904.
26 Marcilla Arrazola, 1954, 2, pp.69-70. This is equivalent to the output of about one hectare.
27 Ibid. p.70.
28 For example, in Spain by the early 1950s, crushing by treading had disappeared in "almost" all wineries, with the notable exception of sherry making in Jerez de la Frontera. Ibid., p.70.
A second advantage was speed. To make good wine it was necessary to fill vats as quickly as possible, because the entry of newly crushed grapes would set off a secondary fermentation with the must already present. Many small producers, however, owned only one, or at best two, vats, which had to serve for their whole harvest, and so new must was constantly being added during the harvest. In addition, small producers often had to sell the must immediately after its fermentation, as they lacked storage space to mature it.29 This encouraged producers to carry out a long fermentation, in open vats. A major restriction to improving wine quality was therefore the need for both sufficient and adequate space for fermentation and maturing, and the relatively high investment that adequate storage implied. Although in the interwar period some growers in France began to experiment with a shorter fermentation of five or six days, and to produce a lighter wine which was quick to mature,30 this was not an option for many small producer. Indeed, many medium and small producers were unable to produce wine which would last longer than the spring.31

For large scale producers, as we shall see when we consider cooperatives, the direction of technological change offered important economies of scale, which allowed wines to be produced more cheaply, of a better quality (scale allowed the employment of trained chemists and the provision of a laboratory), and gave the owner greater bargaining power for the sale of wine.

3. Formal and informal cooperation in the vineyards.

Prior to the late nineteenth century, most grape production was small scale, with vineyards being worked by either the landowner using family labor, or some form of sharecropping contract. This was because in traditional viticulture the low price of most wines did not compensate the high monitoring costs of wage labor. Monitoring labor was costly because ploughing and hoeing too close to the vines would damaged the roots, and poor pruning not only affected yields, but might also damage permanently the plant.32 Obviously, where wines fetched high prices, such as in the better vineyards of Bordeaux or Jerez (sherry) for example, then estate owners were compensated sufficiently to make the use of wage labor attractive. In most places, however, they were not. Vines were also rarely rented, as tenants would have been tempted to maximize output before the end of their lease,

29 This was true of much of Barcelona in the 1880s, for example. Archivo del Ministerio de Agricultura, 81-3.
30 Loubère, 1990, p.89.
leaving the landowner with a vineyard whose productive life had been significantly shortened.

However, the movement of wine prices and wage costs, and the changing nature of the post-phylloxera production which we have seen, encouraged cooperation. We shall look at three such areas where this occurred. First, the joint purchase of inputs and exchange of technical information, especially amongst smaller growers. Second, for large landowners, the heavy labor costs associated with replanting vines encouraged the use of a wide variety of sharecropping contracts. Finally, cooperation was encouraged between large landowners - who looked for ways of reducing monitoring costs, and thereby to increase the scale of production, and smaller family growers - who wanted to benefit from the scientific and technical advances taking place.

Although passed essentially to help trade union activities for industrial workers, the 1884 law on association in France had its biggest impact in the countryside. Between 1884 and 1910, the number of agrarian syndicates increased at the rate of about 210 societies a year, to reach 5,146 syndicates with 777,066 members. Wine producers were quick to take advantage of the new legislation. In the first instance disease, especially phylloxera, created major problems which growers individually could not solve. Syndicates collected and circulated information amongst members on the best way to deal with phylloxera, and provided information and instructions on the use of new root stock and grafting. A second area was the provision of the vines themselves, chemicals and fertilizers. This benefited growers not just because bulk purchases were cheaper, but because the syndicate was able to check quality, especially important as fraud in all countries was a major problem, for at least the first half of our period. Finally, in France, syndicates helped to check another form of fraud, namely that of the production and sale of “artificial wines”, which many growers believed was the prime reason for the weak prices. In time, the syndicates would have an important role in the running of appellation contrôlée. Elsewhere, syndicates were less important than in France, but the same problems encouraged a group response, rather than an individual one.

By contrast, at the farm level, there were a number of areas where the landowner, and those who worked the vines, could cooperate for mutual advantage. In some areas, sharecropping was a convenient way for landlords to work the land, as the sharecropper participated in any increase in harvest, and therefore had an incentive to work the vines
carefully, thereby reducing monitoring costs for the landowner. Yet problems of moral hazard remained. A sharecropper might attempt to increase the short term output of the vine at the expense of reducing its commercial life, if he had previously decided to leave the farm in the near future. This problem was overcome in two very different ways. First, in the case of the rabassa morta in Cataluña, the vines were the actual property of the sharecropper. Because sharecroppers would replant the dead or dying vines, the contracts were essentially indefinite until phylloxera struck in the late nineteenth century. The advantage for the landlord of the rabassa morta was that monitoring costs were non-existent, and management requirements were reduced to collecting the agreed share of the harvest, usually a third. Even after phylloxera, many contracts remained longer than the expected life of the vineyard.

A second very different sharecropping model was found in Tuscany and elsewhere in central Italy, the mezzadria. Here vines were only a part, and at times a small part, of the sharecroppers output. Cropping decisions were taken from the central farm (fattoria), and management input was significantly higher than found in Cataluña. Contracts were annual, and the sharecropper was required to use all the family labor on his farm (podere). Problems of moral hazard and incentives were overcome by the tradition of renewing contracts annually, although with the landlord retaining the right to evict sharecroppers if they wished.

Both of these sharecropping contracts had a long history, with the mezzadria being widespread by the thirteenth century, and the rabassa morta from the seventeenth century. Both were also essentially long term contracts, and appear to have functioned well prior to the late nineteenth century. Then, as has been argued for Cataluña, the impact of rising wages, weak wine prices, and increased costs because of phylloxera all weakened the incentives for both landowners (who saw management involvement increase sharply), and sharecroppers (who saw the opportunity cost of their labor rise as industrialization increased rapidly in neighboring Barcelona). In Tuscany there was also unrest, with strikes for example over who should pay for the new chemicals that vines required. Yet the ability of landowners here to either direct resources to other more profitable crops in areas where the vine was of less importance, or attempt to raise product quality, and promote the chianti brand name,
allowed greater flexibility than in Cataluña (the Chianti Classico area was redefined in 1932). In Cataluña the most successful diversification away from table wines was the production of cava, a sparkling champagne type of wine, which accounted for less than one per cent of output in the early 1930s. Nevertheless, the diverse movement of labor costs and farm prices, combined with the growing capital requirements of agriculture produced the same tensions in Tuscan society as in Cataluña, and the mezzadria was abolished shortly after our period ends.

However, if phylloxera coincided with an upward movement in wage costs and weak wine prices, which increased tensions between landowners and sharecroppers in areas were contracts were considered long-term, elsewhere they provided an incentive for large landowners to attract landless labor and establish sharecropping contracts for the first time. Replanting after phylloxera required large quantities of labor to clear the old vines and prepare the land for the new ones and, despite the greater capital needs for purchasing American vines and chemicals, many areas of the Mediterranean's viticulture remained labor intensive. In both Campo de Cariñena and Navarra in Spain, for example, landowners used sharecropping contracts for apparently the first time after phylloxera, to replant and work the vines. 39

The conditions of the late nineteenth century were also ideal for the rapid growth of extensive viticulture in two relatively new regions, namely La Mancha in central Spain and Puglie in southern Italy. Both areas benefited from low cost land and labor, and their distance from major urban markets was significantly reduced with the railways. In La Mancha, the very dry climatic conditions reduced the risks of vine diseases, and therefore made the use of chemicals unnecessary in most years. Yields were smaller, but so were production costs. Under these conditions the area under vines in La Mancha increased from around 170 thousand hectares in the late 1880s, to 375 hectares by the early 1930s. Much of this increase took place on large farms, and land which had previously been used for extensive cereals or poor grazing. To attract labor, and reduce monitoring costs, landowners used a wide variety of sharecropping contracts to plant and cultivate the vines. 40

In Puglie, the area of vines increased from 134 thousand hectares in 1879/83 to 282 thousand in 1913, a figure which was maintained in the early 1950s. 41 Like La Mancha, much of this increase took place on land where population density was low, and cultivation extensive. Land ownership was also large, and contractual conditions for sharecroppers varied

40 Carmona, forthcoming.
depending on the relative scarcity of labor, and the price of wine. Phylloxera, and the collapse of wine prices in the late 1880s saw many of the old contracts come to an end but new ones, often more attractive to the sharecropper, appeared in their place. However, sharecroppers in Puglie were usually only part time, and their main income came from working as wage earners on the large estates. Although it is not clear what percentage of vines were worked using sharecroppers, the system helped keep a skilled, local wage labor force available for larger farmers, a role played by small property owners in the Languedoc.

In the Languedoc, large landowners preferred capital intensive, high yield viticulture, using wage labor, rather than sharecropping. Even prior to phylloxera, some growers had moved production from the hills - where quality wines, but in relatively small quantities were produced, to the fertile plains. After phylloxera, the planting of grape varieties such as Aramon, or direct producers, brought significantly greater yields - often a 100 hectoliters or more a hectare, but of very poor quality. High yields required heavy inputs of labor, which was made easier by the fact that the traditional high monitoring costs found in viticulture were slowly being reduced. First, and following the work of Guyot, the new vines of the plains were planted in straight lines and trained to grow up wire trellises. As Guyot wrote, not only did this make it considerably easier to cultivate the vines, but:

"Par un simple coup d’oeil le long de sa vigne alignée, le propriétaire constate l’exactitude ou l’incurie de son vigneron: le maître vigneron, de son côté, contrôle avec la même facilité la quantité et la bonne façon du travail de chacun de ses ouvriers."

Second, pruning knives which, unless kept very sharp, often tore the vines, were replaced by the secateur from the late nineteenth century. Finally, and as Pech has shown, landownership over the period became increasing concentrated in two different sizes: estates of 40 hectares or more, and those of less than 10 hectares. Large estate owners reduced monitoring costs of wage labor, not just by following Guyot and redesigning their vineyards, but also by increasing incentives for good work. In the first instance, growers with not
enough land to employ their whole family fully, found skilled employment on the estates which might be repeated indefinitely on an annual basis if done well. In addition, landowners were sometimes willing to let skilled vinedressers work a six hour day, finishing at two or three o’clock each afternoon so that they might then return to work their own vine.\textsuperscript{47} A second area of incentives for good work was the sharing by large producers of technical knowledge by, for example, allowing workers to remove suitable rootstock for their own vineyards. Third, large producers could provide access to their wine making facilities for the small growers in exchange for labor in the vineyard.\textsuperscript{48} Therefore the rapidly changing nature and growing capital requirements of viticulture helped large owners to bargain more effectively for labor, thereby offsetting, at least in part, the rising costs of wage labor. Finally, economies of scale were becoming greater in vineyards. In the Languedoc in the early 1950s it was estimated that one man and an animal could be employed with seven hectares of vines. Yet at this time over half of all vines were found on vineyards smaller than this size. Some growers obviously had other land, and were thus able to find sufficient work to keep an animal. However, many did not, and instead entered into formal and informal contracts with other larger farmers.\textsuperscript{49}

4. The growth of cooperatives.

In France, societies for the collective manufacture of cheese - the "fruitières", date back from the twelve century.\textsuperscript{50} The law of 31st March 1884, which removed the need for government consent for any association of more than twenty people, is generally considered as providing a major incentive to the development of modern cooperatives. Some of these were producer cooperatives although, as Table 4 shows, cheesemaking remained by far the most common on the eve of the First World War. This was hardly surprising, as they were relatively small and required limited quantities of capital. The first French wine cooperative appeared in 1901 at Mudaisan, quickly followed by another at Maraussan, both in Hérault (Languedoc).\textsuperscript{51} The law of the 29th December 1901 (together with the decrees of 30th May and 26th August, 1907) allowed agrarian cooperatives of production and sale access to long term credit at the almost uniform rate of 2 per cent for 25 years. Capital was provided by the state, but lent through regional credit banks, who were responsible for the loans. Monitoring

\textsuperscript{47} Smith, 1975, p.365.
\textsuperscript{48} Frader, 1991, p.36.
\textsuperscript{49} \textit{Etudes et Conjoncture}, 1956, 6, pp.530-1.
\textsuperscript{50} HIA, 1911, 1, p.280. In northern Italy a similar institution, the \textit{turnario sociale} dates from slightly later.
therefore was done by local banks, but transaction costs were greatly reduced because cooperatives were required to establish a specific legal structure if they wished to receive loans.

Access to long term credit was certainly not the only, or even the principle reason, for the founding of these early cooperatives. Many were strongly influenced by socialist ideology, and were seen as a solution to the extremely low wine prices between 1900 and 1907. It was under these conditions that "les vignerons libres de Maraussan" established a producer's cooperative to sell wine to consumer cooperatives in Paris. But as early as 1906 the members had constructed and equipped a modern cooperative winery, which had an initial capacity of 15,000 hectoliters, at a cost of 175 thousand francs. The Ministry of Agriculture contributed 30 thousand francs, the local regional bank (under the 1906 Law) provided a long term loan of 109 thousand francs, and a further 30 thousand francs was raised from consumer cooperatives in Paris. The subscription of the 120 members was just 25 francs each. The example of Maraussan provides two important insights, namely the contribution that ideology, in this case socialism, can play in setting up a simple wine cooperative, but the very high capital costs involved in constructing a large, modern winery.

Although the low wine prices between 1900 and 1907 encouraged the formation of cooperatives - the "filles de la misère", Table 5 shows that numbers continued to grow steadily throughout the first half of the twentieth century, with only a temporary halt during the two world wars. By the time of the economic crisis of the early 1930s, cooperatives numbered 630, significantly more than in either Italy or Spain. The severe difficulties of the early 1930s saw a number of attempts at state intervention in the wine market, and cooperatives were seen as a useful instrument for policy implementation. By the early 1950s, cooperatives produced about a quarter of all French wines, a figure which reached over half in the Rhone Valley.

The French experience was not matched by either Italy or Spain. In both countries, the first wine cooperatives predated those of France. In Italy, a cantine sociale was established at Bagno di Ripoli, near Florence in 1888, and around 1910 there were reported to have been "slightly in excess of 150". But most cooperatives were short lived, and in 1924

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51 Lachiver, 1988, pp.482-3.
53 Warner, 1960, chaps. 6, 7 and 8.
54 In Algeria it was 17 per cent.
55 IIA, 1915, vol.2, p.152. A further 40 cooperative distilleries were also active. The cooperative at Bagno di Ripoli was not active long.
numbers were down to 80, before recovering to 128 in 1933, and accounting for 1.3 per cent of the nation's wine production. We shall leave to section 5 comments on why this initial growth of Italian cooperatives faded so quickly. In Spain it was claimed that there were 215 wine cooperatives and 19 distilleries in 1952, with a total membership of 60 thousand growers, and producing about 1.5 million hectoliters, or ten per cent of national output. In Spain, as in France and Italy, the number of wine cooperatives was increasing fast in this period, but these figures are likely to include a number whose wine making facilities were still under construction. Furthermore, even if the output figures are correct, the harvests of the early 1950s were exceptionally low. Prior to the 1936-9 Civil War, wine cooperatives in Spain were probably well below a hundred.

Wine cooperatives, were established for three distinct activities: the crushing, fermenting and pressing of grapes; the maturing and selling of wines; and the processing of the wine lees - the remains of the grapes after they had been crushed, to make both spirits and tartic acid. These activities suggest five economic reasons why small growers were attracted to setting up a cooperative.

In the first instance, there were economies of scale in wine making, as we have already noted in section 2. These economies became increasingly apparent as the period progressed. By the early 1950s, the average size of a wine cooperative was 15,000 hectoliters, costing 60 million francs, which was beyond the means of even medium sized wine producers. The greatest economies were achieved not in the production of quality wines, but with table wines, where large quantities could be pressed and matured together. There were, however, limits to the economies of scale, even with table wines. For example, one of the major problems during fermentation was the need to control temperature. If vats were too large, then the wine became too warm and the fermentation process stops. In general, vats of 300 hectoliters were considered about the maximum, although if they were made of concrete, which absorbed more heat than wood, they might be slightly larger. In one very large private winery in Aude (Languedoc), which had 215 hectares of vines producing 30,000 hectoliters of wine, at the rate of 1,400 hectoliters a day, there were 20 fermenting vats, each with a capacity of around 350 hectoliters. In fact, the first half of the twentieth century probably saw a reduction in the size of vats, as the fermentation process became

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56 Annuario Statistico Italiano, 1933, pp.145 and 147.
57 BOIV, 1952, no. 253, p.63.
better understood. Likewise, there were limits to the size of the maturing vats. Therefore according to one report, the capital cost per unit of capacity of "une simple curve" of 15 thousand hectoliters was given exactly the same as that of one of 175 thousand. By contrast, unit operating costs of larger wineries were often lower. Thus one cooperative in 1950 processing 152 thousand hectoliters required only 40 per cent labor per hectoliter than was used in another, processing 11 thousand; in another study, this time of 12 cooperatives in 1949, the cost of wine making varied between 78 and 169 francs per hectoliter. In part, cost comparison are made difficult because of the treatment by cooperatives of interest and depreciation in their accounting. However, and in conclusion, although economies of scale no doubt were a factor in the decision in setting up a cooperative, the fact that wine making represented only between 3 and 8 per cent of the final price suggests it was probably not crucial.

Probably more important than cost savings was the improved quality and consistency of wines produced by better management and technical skills. The scientific knowledge concerning the nature of wine and the problems associated with its making and storing increased significantly after the publication of Pasteur's major work in 1864. Although technical debates on such issues as the ideal length of time for the fermentation, or the best way to treat wine which was becoming unstable would continue, the technical equipment and skills required in viniculture if drinkable wine was to be consistently produced had by the early twentieth century, if not before, moved well beyond what the majority of grape producers could either understand, or carry out. As Galtier notes, cooperatives created a new type of professional - a manager who was both an oenologist and who at the same time could attend to the legal and commercial sides of the business. At first, the technical processes were often directed by a respected member of the community, but increasingly the larger cooperatives looked for trained agronomists, and especially oenologists. In France, from 1939, the Ecole Nationale d'Agriculture in Montepellier started annual courses specifically for cooperative technicians.

A third potential advantage were economies of scale in marketing. Cooperative

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60 B'OIV 1952, no. 254, p.43.
61 B'OIV, 1952, no.254, p.41. In Spain, by contrast, a winery with a 20,000 hectoliter capacity was estimates to cost two million pesetas, with smaller ones increasing by 15 per cent, and larger ones falling by the same amount. B'OIV, 1952, no.254, pp.31-2.
64 Galtier, 1958, I, p.376.
members had better access to urban markets by producing large quantities of a standardized wine under scientific conditions, than by trying to sell individually their own production. Pech notes how one giant private producer with facilities to produce 100 thousand hectoliters, the Compagnie des Salins du Midi (C.S.M.) received on average 19.25 francs per hectoliter in the period 1893-1913, against a regional average of 16.00 francs. By contrast Gély, a small producer in the same region who produced little more than 400 hectoliters, received 27 per cent less than the C.S.M. during the period 1893-1906. Of greater importance, in poor years the difference was even greater, Gély being paid only 4.8 francs in 1904 against 11.5 francs, received by the C.S.M. As noted above, the Maraussan cooperative was initially established for the sale of wines, rather than their production. However, plenty of growers, especially in areas of better quality wines, took their grapes to the cooperative for crushing and fermenting, but sold the wine themselves. We shall return to this point in section 5.

A fourth advantage was that cooperatives reduced a farmer's labor requirements by increasing capital, a feature not usually considered necessarily beneficial on small, family farms. However, because labor was saved at the harvest time when family resources were fully stretched, it often reduced the growers' need for wage labor, rather than making family labor idle. Furthermore, the fact that growers no longer fermented all their grapes in a single vat, which required the harvest to be collected as rapidly as possible, reduced further the need to employ wage labor.

Finally cooperatives were established for processing the remains of grapes after wine making. Small producers had often traditionally produced spirits themselves, but new technology allowed entirely new products to be produced.

5. What explains the success or failure of wine cooperatives?

In the previous section we have seen that the growth of cooperatives varied significantly between countries, and that although they appeared later in France than in the other two countries, by the interwar period they had become more widespread. Of particular interest is the Italian case because, after an early rapid growth, numbers then declined. For the historian, even more difficult than establishing with any certainty the total number of cooperatives and their membership in any single year, is the difficulty in showing to what extent changes in total numbers occurred because new cooperatives came into operation, or

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65 Pech, 1975, p.158.
because old ones disappeared. For Italy it is possible to show the low level of long term success of the early cooperatives in a little more detail. In 1904 the Italian state established a fund of 700,000 lire to encourage the modernization of wine making facilities. The 1908 report gives details of 33 cooperatives which took part successfully in obtaining a share of these funds. Of these 33 cooperatives, only twelve were still active twenty five years later, in 1929. By 1958, of these surviving twelve, three were still definitely operational (Oleggio and Mombaruzzo in Piemonte, and the Cantina Sociale della Pioppa at Carpi in Emilia), and another five perhaps working. Of the remaining four, three were not mentioned in the 1958 survey and the fourth, Soave (in Verona) is given as having started in 1930, with the original one presumably having to ceased to operate. Therefore our sample of 33 in 1908 was severely depleted by the late 1920s which supports contemporary opinion that Italian cooperatives found it difficult to remain active for very long.

What explains the differences in the success of cooperatives, both between different countries, and within them? In the first instance access to capital was critical. Most writers argue that the long term, low interest loans provided by the French government were a positive incentive for growers to set up their cooperative. As we have noted, the state provided either directly or indirectly four fifths of the capital requirements for the Maraussan cooperative in 1906, a figure which remained similar at the end of our period. In addition, the state provided free technical information on the construction and equipping of the cooperative, and favorable tax conditions. These advantages which French wine producers enjoyed can best be appreciated by looking at the situation in Italy and Spain. In Italy, the lack of government backed loans implied that capital was difficult for cooperatives to obtain and expensive, and was a frequently cited for their slow growth in the 1920s. In Valencia in Spain, the small growers in Utiel had to wait 22 years before they were able to construct their own winery, whilst in neighboring Requena, cooperative members themselves constructed the

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67 These will be included in the final version of this paper.

68 Among these twelve I include Mombaruzzo in Piemonte, even though it is not given in 1929 or 1931 as being active, because it appears in a later list in 1958. Sources used are, MAIC, 1908; Friedmann, cited in Clique, 1931, pp.243-45; Po, 1931, pp.37-47 and Cosmo, 1958, pp. 95-131.

69 For these five, although cooperatives existed in the same villages in both 1908 and 1958, the 1958 list fails to provide a date for when the cooperative started.

70 Gide, 1927, pp.92.

71 The state provided 20 per cent directly and a loan of 60 per cent was available from the Caisse Nationale de Crédit Agricole, with member required to find the remaining 20 per cent, divided according to individual harvest size. Galtier, 1958, 1, p.346.

72 For example, Berget, 1925, p.9 and Gide, 1926, pp.94-5.
building over a three year period. One recent study of the pre Civil War period in Spain concludes that, although the financial obstacles to establishing cooperatives were not the only ones, they were the decisive. But in both countries the situation by the early 1950s had improved significantly. In Italy, the law of 1931 provided three million lire of state money for non-repayable grants of up to 20 per cent of long term investment for new cooperatives, and 15 per cent for improvements of those already in operation, and loans also became easier. The 1952 law provided conditions not so different from those in France, with state backed loans of up to 75 per cent of capital expenditure, at 3 per cent interest. In Spain, by the early 1950s, the Ministry of Agriculture was also providing loans of up to 80 per cent of the capital cost of cooperative installation, over a ten year period and at 2.5 per cent interest.

A second factor in explaining the different rates of growth of cooperatives is ideology. In France, for example, the early success of many of the small cooperatives in the south, and in particular in Var, is attributed to the role played by socialism. The catholic church was very active in some areas of France as well, with competition between the different groups benefiting farmers. However in Italy, one of the chief weaknesses of the cooperative movement as a whole was "the rapid and excessive multiplication of societies having the same aims and, inevitably, competing with each other." By the early 1920s, there were three main groups - the Lega Nazionale delle Cooperative which allied itself to the socialist, the Confederazione Cooperativa Italiana, formed by the catholics in 1921, and finally, the Sindicato Italiano delle Cooperative, formed by the fascists in the same year. A national federation of cooperative wineries, the Federazione delle Cantine Sociali was established in 1922. With the coming to power of the fascists in 1922, there was a reorganization of cooperatives, and a single body, L'Ente Nazionale Fascista dell Cooperazione created. The closure of many socialist cooperatives explains, at least in part, the stagnation of the movement in this period. By contrast in Spain, it was the catholic church which provided the ideological stimulus for the cooperative movement, accounting for about 90 per cent of the total in 1919. Although active membership in agricultural cooperatives reached over half a million by the early 1930s, their involvement in production, and in particular wine making,
was limited.\textsuperscript{81} It is of interest to note that socialist interest in farm problems in Spain was virtually non-existent until just prior to the Civil War.

Although access to long term capital and the role of ideologies explain part of the relative success of wine cooperatives in each country, there are certainly not the only factors. In particular, there were significant variations in the regional concentration of cooperatives within each country, as shown in Table 6. In France 71 per cent of all cooperatives were found in the south in 1951, with over half of all growers belonging to one. In Italy concentration was even greater, with 83 per cent of cooperatives being in the North of the country. Finally in Spain, the Mediterranean and Navarra accounted for 79 of the total. It is perhaps not surprising to find cooperatives in regions were viticulture was of importance. However, and what has to be explained, is why they were rarer in some major wine producing areas.

A number of explanation can be put forward. First, there had to be a concentration of growers if the cooperatives were to receive sufficient grapes. Cooperatives would be unattractive to potential members if it took the grower a couple of hours to transport grapes by mules to the cooperative, an hour to unload them, and then two hours to return to the vineyard. Motor transport would, of course, eventually reduce the problem of distance but, and as one contemporary wrote, an owner with motor transport in the mid 1920s would be in no need of a cooperative!\textsuperscript{82} A successful cooperative was likely to be found in a village with both a sufficient volume of grapes, and fragmentation of land ownership. In France in 1951, the average cooperative had a capacity of 20 thousand hectoliters, and a membership of 209, producing about 100 hectoliters each.\textsuperscript{83} Yet within the country, there were important differences. In particular, cooperative members in the Languedoc were quite clearly the smaller growers of the region (56 per cent of growers, producing only 26 per cent of the wine), whereas in the "rest of France", there were above average size (3 per cent of the total, producing 23 per cent of the wine). In the "rest of France" cooperatives had fewer members (164 members against 212 in the Languedoc), but each produced over twice as much wine (119 hectoliters against 53). Information of individual production within a cooperative is unfortunately scarce. In Vergèze (Languedoc), where average production was 112 hectoliters, over of the half members contributed less than 50 hectoliters, and 12 per cent of members

\textsuperscript{80} Garrido, 1996, p.61.
\textsuperscript{82} Gide, 1926, p.138.
\textsuperscript{83} Calculated from B'OIV, 1954, no.283, pp.46-7.
were responsible for half of all output, at an average of 485 hectoliters per member. What this suggests is that, although cooperatives might attract relatively large numbers of part time growers, at least half their production would be provided by full time professional grape growers.

This brings us to a second, and related point, and that is the demand by growers for a wine cooperative. Their relative absence in regions such as Puglie, Tuscany, or La Mancha until after the Civil War, was partly because of the presence of large private producers. A cooperative of 15,000 hectoliters for example, required a feed area of approximately 1,000 hectares in the province of Ciudad Real in La Mancha, and 715 in Puglie in the early 1920s.\(^8^4\)

As we have commented, sharecropping was an important feature in the significant growth in vines in both these regions during the period. Sharecroppers had little capital, and landowners or wine merchants constructed the wine making facilities. At time of conflict, such as in La Mancha in the immediate years leading up to the Civil War, it was the low price of grapes which wine makers were offering, rather than the price of wine, which was in dispute.\(^8^5\) Likewise in a traditional sharecropping region, such as Tuscany, it was the central farm - the fattoria - which made the wine of all the sharecroppers. In 1950 there were still no wine cooperatives in Tuscany, despite the region producing about a tenth of the nation's wine.

For sharecroppers, the temporary nature of their contracts was also an obstacle for the long term investment in a cooperative. The cantina sociale in Piumazzo (Modena) tried to overcome this problem by having two types of members: permanent ones (soci effectivi), who could only leave the cooperative if they sold their land or in other, strictly defined circumstances, and annual members (soci annuali) -sharecroppers who could use the cooperative facilities, but who played a very limited role in the administration.\(^8^6\) In general, therefore, cooperatives were late to appear in those regions where sharecropping was found. One notable exception to this rule is Cataluña. However in this region, contracts often lasted for the life of the vine, giving the sharecropper greater stability to make the long term commitment that cooperative membership usually required.

The major expansion of viticulture in the Languedoc was also accompanied by an early and rapid growth in cooperatives. Here in contrast with both Puglie and La Mancha, growth was accompanied with the spread of small property ownership which co-existed with

\(^{8^4}\) Average yields in 1922/6 were 15 hectoliters in Ciudad Real, and 21 in Puglie.

\(^{8^5}\) Ladron

\(^{8^6}\) Clique, 1931, pp.246-7.
the large vineyards, rather than sharecropping. The strength of this small property ownership, and the access to long term cheap bank loans made the development of cooperatives much easier than in either Puglie or La Mancha.

A third explanation of the different speed of regional growth was wine quality. In much of Europe in this period each grower produced a variety of different grapes. These were then often mixed together haphazardly during production, but the final product of each grower was very different, depending on the mix of grapes that had been used. Although one of the major advantages of cooperatives was their ability to produce a standardized product, they in general found it hard to price grapes other than by their sugar content. One possibility, common in Italy during the 1920s or with some of the middle quality Bordeaux wines in the 1930s and 1940s, for example, was for growers to bring only part of their harvest to the cooperative, and press themselves those grapes which they felt produced the best wine. However, if this helped overcome the problem of the diversity of grape varieties in a region, it had two obvious negative consequences. In the first instance, growers who only used the cooperative for perhaps half their production, would have less interest in its long term success. Second, it was the poor quality wines made from the least desirable grapes, which was considered one of the major weaknesses of the Italian cooperatives in this period. Grape variety also helps to explain the high density of cooperatives in the Languedoc, where they had become more standardized than in most other regions, with the aramon (red wines) and clairette (white) predominating.

Quality wines could, and indeed were, produced in cooperatives. The fact that fermenting vats were about 300 hectoliters - the equivalent of perhaps ten hectares production, allowed larger growers the possibility of using the superior technologies (and scientific knowledge) available in the cooperative, but then keeping their wines separate from the rest. After fermentation, the wines were collected from the cooperative, and matured in their own private cellars.

A fourth factor was clustering. Cooperatives, at least prior to the Second World War, were in general found around a major center of commercial viticulture in each country, namely the Languedoc, Piedmonte and Cataluña. After the first few cooperatives were established, each region used its major wine journals, wine research centers, specialist

87 For the lack of sharecropping in the Languedoc, see Pech, 1975, p.55.
90 Gide, 1927, pp.92-3.
equipment producers, etc., to help in the diffusion of the cooperative concept. To reinforce this, regional federations were founded whose aim, amongst others, was quite naturally to establish more cooperatives. Even when national associations appeared, meetings and conferences tended to be held in those areas where the concentration of cooperatives was already high. This did not make it impossible for cooperatives to develop in new areas. However, when the Compagnie ferroviaire d'Orleans wanted to encourage producers in the southwestern France to build cooperatives, it had to organize visits for prospective members to the Burgundy, to see one in operation.

Conclusion

This paper has shown how in the face of adverse wine prices and rising production costs, grape and wine producers looked not just to new technologies, but also to formal and informal cooperation as a means of remaining competitive. Although it is the large wineries which are the most visible source of cooperation amongst growers, this paper has tried to place equal emphasis on other informal cooperation. Contracts often proved remarkably adapt at changing to different circumstances, and informal and unwritten contracts of a wide nature existed, both helping landowners secure adequate skilled labor at cheaper rates, and for smaller, sometimes illiterate growers, to capture some of the benefits of the scientific revolution through which viticulture was passing. In the Languedoc, a region which has featured prominently in this work, it was reported that even at the end of our period, about two thirds of all vineyards, and a quarter of the region's vines were found on holdings of less than three hectares, where growers lacked all the necessary equipment. The report concludes that it was only mutual aid which allowed vineyards of this size to remain viable.

Cooperative wineries provided access for small and medium sized producers to the rapidly improving scientific knowledge of wine making, together with equipment which was far beyond their means to obtain privately. Cooperatives also improved growers' bargaining power for selling the wine. However, without access to long term credit, it was difficult for cooperatives to be established. By the end of our period the movement was taking on a very new phase in France, with wine cooperatives being used by the state to help coordinate intervention in the wine market, both by limiting the types of vines used by growers, and by

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91 One major exception to this rule was Navarra, the home to 22 per cent of Spain's wine cooperatives in the early 1950s. The explanation here is a different form of clustering, in this case the province had an unusually high level of cooperative activity in all areas of agriculture. See, especially, Majuelo and Pascual, 1991.
controlling the release of wine onto the national market. The extent by which these forms of cooperation amongst producers was efficient is more difficult to measure. Without the formal and informal cooperation shown in this paper, there can be little doubt that the speed of the rural exodus would have been faster both before, and after, 1950. But wine cooperatives appear to have competed amongst themselves, with market regulation being provided by the state. Finally, wine prices, and wine quality, both moved in a favorable direction for consumers in all three countries.

93 Études et Conjoncture, 1956, 6, p. 530.
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Nominal wine prices have been divided by the cost of living index of each country.

Sources:
Table 1.
Wine production and world trade.

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</table>

Figures in millions of hectoliters.

Sources: Mitchell, 1975, pp.278-82 and 345-50. Output figures refer to must, some of which was used for making vinegar. Spanish 1880/4 output refers to 1885, Antúnez, 1887, p.16.

Table 2
Changes in relative wages and wine prices.

<table>
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<th></th>
<th>France</th>
<th>Italy</th>
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<tbody>
<tr>
<td>1870-9</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1880-9</td>
<td>76</td>
<td>6</td>
<td>82</td>
</tr>
<tr>
<td>1890-9</td>
<td>118</td>
<td></td>
<td>124</td>
</tr>
<tr>
<td>1900-9</td>
<td>184</td>
<td>156</td>
<td>134</td>
</tr>
<tr>
<td>1910-9</td>
<td>96</td>
<td>139</td>
<td>130</td>
</tr>
<tr>
<td>1920-9</td>
<td>142</td>
<td>180</td>
<td>288</td>
</tr>
<tr>
<td>1930-9</td>
<td>188</td>
<td>344</td>
<td>300</td>
</tr>
</tbody>
</table>

Nominal wages have been divided by wine prices.

Sources:

Italy: wages – 1870-9 taken as 1.5 lira; Arcari, 1936, pp.270-1; wine prices – ISTAT, 1958, p.178.

Table 3

AREA, OUTPUT AND YIELDS IN VITICULTURE.

<table>
<thead>
<tr>
<th></th>
<th>1880/4</th>
<th>1909/13</th>
<th>1925/29</th>
<th>1950/54</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>2125</td>
<td>1597</td>
<td>1520</td>
<td>1395</td>
</tr>
<tr>
<td>Production</td>
<td>33.34</td>
<td>46.62</td>
<td>56.84</td>
<td>56.18</td>
</tr>
<tr>
<td>Yield per hectarea</td>
<td>15.7</td>
<td>29.2</td>
<td>37.4</td>
<td>40.3</td>
</tr>
<tr>
<td>Algeria</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>40</td>
<td>137</td>
<td>214</td>
<td>368</td>
</tr>
<tr>
<td>Production</td>
<td>0.62</td>
<td>7.90</td>
<td>11.06</td>
<td>15.58</td>
</tr>
<tr>
<td>Yield per hectarea</td>
<td>15.9</td>
<td>57.5</td>
<td>51.7</td>
<td>42.3</td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>1307</td>
<td>1852</td>
<td>1808</td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>22.48</td>
<td>46.02</td>
<td>41.19</td>
<td></td>
</tr>
<tr>
<td>Yield per hectarea</td>
<td>17.7</td>
<td>25.6</td>
<td>23.5</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>1710</td>
<td>1278</td>
<td>1438</td>
<td>1483</td>
</tr>
<tr>
<td>Production</td>
<td>21.64</td>
<td>14.86</td>
<td>23.57</td>
<td>17.88</td>
</tr>
<tr>
<td>Yield per hectarea</td>
<td>12.7</td>
<td>11.6</td>
<td>16.4</td>
<td>12.1</td>
</tr>
</tbody>
</table>

Sources: France and Algeria, Lachiver, 1988. Italy. MAIC, 1892; MAIC 1914; ISTAT, 1927. Area of mixed cultivation has been divided by 3.6, and yields multiplied by 1.03 to compensate for grapes not pressed (i.e. table grapes). Spain. Simpson, 1985b and Barciela, 1989.
Table 4

French cooperatives and long-term borrowing, c.1910.

<table>
<thead>
<tr>
<th>Activity</th>
<th>No of cooperatives</th>
<th>No with long term loans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheese making, dairies and butter</td>
<td>2,485</td>
<td>53</td>
</tr>
<tr>
<td>Wine</td>
<td>39</td>
<td>31</td>
</tr>
<tr>
<td>Starch</td>
<td>34</td>
<td>2</td>
</tr>
<tr>
<td>Collective purchase/ use of agricultural machinery</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>Oil mills</td>
<td>20</td>
<td>9</td>
</tr>
<tr>
<td>Distilling</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Others</td>
<td>42</td>
<td>5</td>
</tr>
</tbody>
</table>

Sources: I.I.A. 1911, pp.277 and 281.

Figures for the number of cooperatives and membership are only approximate, as there was often a delay between their formation and the start of production, and those cooperatives which ceased activity often remained officially active for a number of years in the official figures.
# Table 5

Growth in wine-making cooperatives in Italy, France, and Spain.

## Italy

<table>
<thead>
<tr>
<th></th>
<th>Number of cooperatives</th>
<th>Number of members</th>
<th>Capacity (000s hl)</th>
<th>Wine produced (000s hl)</th>
<th>% of wine harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1924 (a)</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1928 (b)</td>
<td>84</td>
<td>10,732</td>
<td>1,200</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>1931 (c)</td>
<td>98*</td>
<td>12,481</td>
<td>917</td>
<td>857</td>
<td></td>
</tr>
<tr>
<td>1932 (c)</td>
<td>128</td>
<td>15,909</td>
<td>1,220</td>
<td>958</td>
<td></td>
</tr>
<tr>
<td>1938 (d)</td>
<td>147</td>
<td>18,820</td>
<td>1,566</td>
<td>934</td>
<td></td>
</tr>
<tr>
<td>1951 (e)</td>
<td>161</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* plus 17 more in construction.

## France

<table>
<thead>
<tr>
<th></th>
<th>Number of cooperatives</th>
<th>Number of members</th>
<th>Capacity (000s hl)</th>
<th>Wine produced (000s hl)</th>
<th>% of wine harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1908 (f)</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1914 (g)</td>
<td>79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1920 (f)</td>
<td>92</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1929 (f)</td>
<td>630+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1939 (f)</td>
<td>827</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1943 (f)</td>
<td>852</td>
<td>142,000</td>
<td>14,480</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1952 (e)</td>
<td>1,023</td>
<td>214,306</td>
<td>20,904</td>
<td>13,461</td>
<td>25.4%</td>
</tr>
</tbody>
</table>

+ 464 were wine cooperatives, and 252 distilleries.

## Spain

<table>
<thead>
<tr>
<th></th>
<th>Number of cooperatives</th>
<th>Number of members</th>
<th>Capacity (000s hl)</th>
<th>Wine produced (000s hl)</th>
<th>% of wine harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 1920s (g)</td>
<td>50-60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1951 (e)</td>
<td>215</td>
<td>60,000</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1953 (e)</td>
<td>263</td>
<td></td>
<td>2,422</td>
<td></td>
<td>12.8%</td>
</tr>
</tbody>
</table>

Sources:

(a) Marchesi, 1925, pp.81-4.
(b) IIA, 1931, p.319.
(c) ISTAT Annuario statistico italiano.
(d) ISTAT Annuario statistico dell’agricoltura Italiana, anno 1939, Roma 1940.
(e) B'OIV 1955, no.290.
(f) B'OIV 1952, no.254.
(g) Lachiver, 1988, p.482.
(h) Rivas Moreno, n.d., p.280.
Table 6.

Regional distribution of wine cooperatives, early 1950s.

A. FRANCE, 1951.

<table>
<thead>
<tr>
<th>Region</th>
<th>No of cooperatives</th>
<th>% of growers in cooperatives</th>
<th>% of wine produced in cooperatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Languedoc-Roussillon</td>
<td>521</td>
<td>56.1</td>
<td>26.4</td>
</tr>
<tr>
<td>Lower Rhone</td>
<td>181</td>
<td>53.1</td>
<td>56.0</td>
</tr>
<tr>
<td>Gironde</td>
<td>61</td>
<td>14.2</td>
<td>21.0</td>
</tr>
<tr>
<td>Rest of France</td>
<td>223</td>
<td>3.0</td>
<td>22.8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>986</td>
<td>13.0</td>
<td>28.0</td>
</tr>
</tbody>
</table>

B. ITALY, 1952-3.

<table>
<thead>
<tr>
<th>Region</th>
<th>No of cooperatives</th>
<th>% of total</th>
<th>% of nation’s wine produced in region</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>172</td>
<td>82.7</td>
<td>40.3</td>
</tr>
<tr>
<td>Center</td>
<td>10</td>
<td>4.8</td>
<td>23.0</td>
</tr>
<tr>
<td>South</td>
<td>17</td>
<td>8.2</td>
<td>25.1</td>
</tr>
<tr>
<td>Islands</td>
<td>9</td>
<td>4.3</td>
<td>11.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>208</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

C. SPAIN, 1952.

<table>
<thead>
<tr>
<th>Region</th>
<th>No of cooperatives</th>
<th>% of total</th>
<th>% of nation’s wine produced in region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andalucia</td>
<td>5</td>
<td>2.3</td>
<td>12.5</td>
</tr>
<tr>
<td>North</td>
<td>1</td>
<td>0.4</td>
<td>9.4</td>
</tr>
<tr>
<td>Castilla, León &amp; Extremadura</td>
<td>6</td>
<td>2.8</td>
<td>17.1</td>
</tr>
<tr>
<td>Castilla-La Mancha</td>
<td>26</td>
<td>12.1</td>
<td>21.7</td>
</tr>
<tr>
<td>Upper Ebro</td>
<td>50</td>
<td>23.3</td>
<td>6.3</td>
</tr>
<tr>
<td>Aragón</td>
<td>4</td>
<td>1.9</td>
<td>3.2</td>
</tr>
<tr>
<td>Mediterranean</td>
<td>122</td>
<td>56.7</td>
<td>29.6</td>
</tr>
<tr>
<td>Canary Islands</td>
<td>1</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>215</td>
<td>99.9</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Sources:
Spain– B’OIV, 1955, no.290.