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FIRM CREATION, FIRM EVOLUTION
AND CLUSTERS IN CHILE'S DYNAMIC
WINE SECTOR:
EVIDENCE FROM THE COLCHAGUA
AND CASABLANCA REGIONS

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**Firm Creation, Firm Evolution and Clusters in Chile's
Dynamic Wine Sector:
Evidence from the Colchagua and Casablanca Regions**

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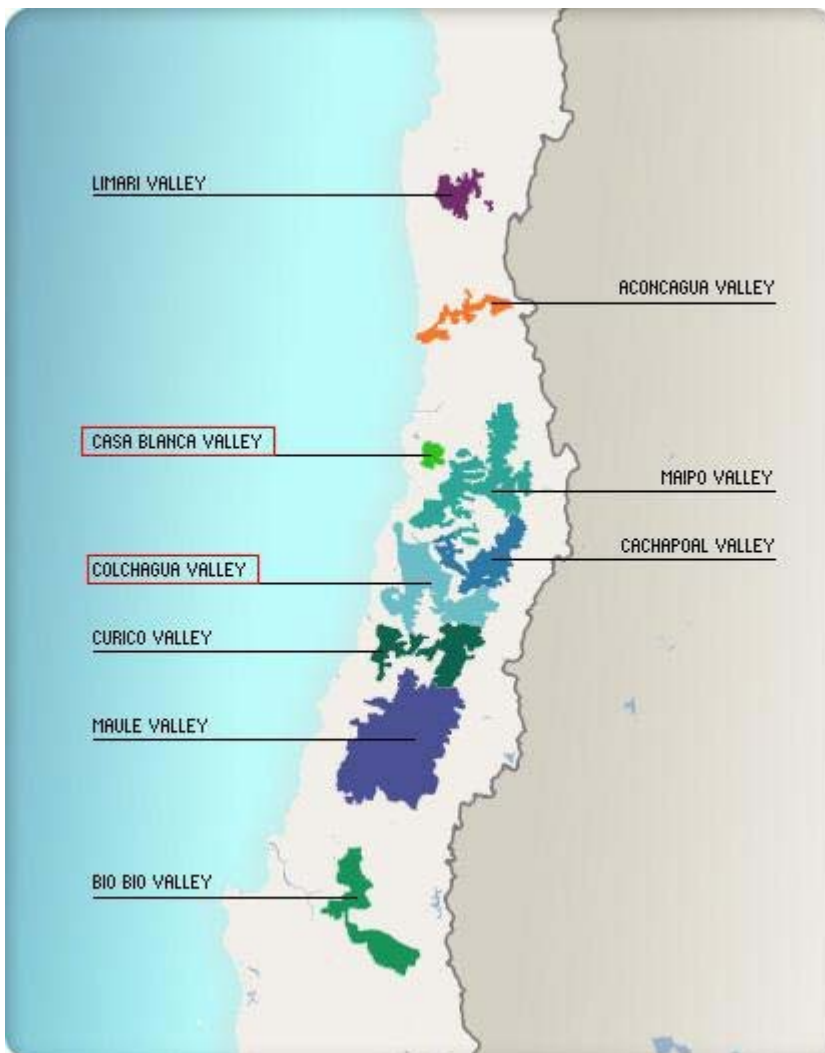
Introduction

Since Chile's adoption of outward orientation, the country has converted itself into the fourth largest producer in exports volume and fifth large producer in export value (ODEPA, 2005 & Olavarria et al, 2008). It has increased its share in the predominant markets, shown by its increase in shelf space in the U.K supermarket (Gwynne, 2008c). The study of how Chile changed around its wine sector in a short space of time (exports only really started in the 1990's) is of highest importance, as it is evident this semi-peripheral country has fought its way into the competitive global value chain. I will study the changing periods of wine history in Chile along with firm creation and the strategic evolution of firms. This will examine in particular the record of process upgrading and upgrading in marketing and branding. An analysis of how these firms evolved will investigate how the Chilean wine sector has gained its success in the global market. Finally, a study of clusters in Chile shall be carried out to show the importance of the firms studied in creating economic growth not just for individual firms but also for the economy of an area.

In order to carry out this study two valleys shall be examined. The first is that of the highly successful Colchagua valley in Chile's sixth region and Casablanca in the fifth region. It is the second most planted region in Chile (Olavarria et al, 2008) and arguably produces the highest quantities of quality wines in Chile. Casablanca, on the other hand it is a relatively young valley, with very little planting of grapes till the early 1990s. It is an example of the extension of traditional wine producing regions in Chile with land under grapes increasing 164% between 1998 and 2006 (Wines of Chile, 2008).

The new dimension of Chile is the east-west axis and there are four major areas in this regard (Richards, 2006: 13-14). The first covers the plateaus and slopes on the western side of the coastal range, where cloudy, humid mornings and stiff afternoon breezes are the norm; this is very much the landscape of Casablanca whose production really took off

Map One: Chile's wine regions Source: (www.chileanwineclub.com, 2008)



in the 1990s. The second is the eastern side of the coastal range, where temperatures tend to be very warm except in the sites that are exposed to some oceanic influence – this is where Colchagua at present starts off its new range of vineyards, The third is the central

depression and the fourth is the contact zone between this flat land and the Andean foothills in the east, where conditions are warm though moderated by mountain downdraughts and southerly winds. Colchagua covers these latter two regions as well.

Methodology

On June 20, 2008, ICARE, an NGO founded by major Chilean companies and devoted to promoting national business improvement and applied research, selected Jorge Matetic as best business and Concha y Toro as best firm for innovation. This research aims to demonstrate how the Chilean wine sector has developed enormously in the last twenty years and is now one of Chile's leading export sectors. In particular, it hopes to demonstrate that the wine industry is a dynamic wine sector that has relied heavily on incorporating innovations not only from global chains of enterprises but also from local networks of firms.

The study has used qualitative methods as these were considered most appropriate to explore the process of innovation and knowledge transfer within firms and enterprises located in what has been defined as a dynamic industrial sector. Qualitative data was collected through in-depth interviews in order to engage with the biographies of key actors in the wine industry in the Sixth and Fifth Regions of Chile. Another primary source of data was that available from the organisation 'Wines of Chile' and Census data from the National Institute of Statistics. Further information was taken from secondary sources. It should be noted that when material available was in Spanish the author has translated it and put the original citation in footnotes. Information was gathered mainly by interviews with fifteen wineries from the two valleys in the period of March 2008 to

May 2008. Interviews were carried out by Helen Dennis or by the author, whose permission has been sought to use these sources.

The wine sector is characterised by a range of significant knowledges which can produce innovation. Each firm will need to develop expertise in all three knowledges (and develop a record of sustained innovation within those knowledges) in order to continually upgrade, improve the quality of these wines and continue an upward trajectory not only in export volume but also in export value.

These three knowledges can be described as:

- 1) Links to the development of natural and agrarian knowledges which will steadily improve the quality of the main input – wine grapes. These knowledges will be mainly local in context and will attempt to maximise the benefit of wine grape production from a particular *terroir*.
- 2) Innovations and knowledges from local networks. Many “cluster” surveys of a tick-box nature have managed to completely ignore the development of local networks of knowledge transfer in the local area. By concentrating on just the entrepreneurs the development of knowledges linked to the process of winemaking and estate management in local networks tends to be overlooked.
- 3) Innovations and knowledges from global networks. Many Chilean wine companies have been successful because they have transformed their products from appealing to the local, national market to products which appeal to global (European and North American) markets. For example, white wines have become less oxidized and dry and more driven by the demands of fruit-driven palates of

global consumers. This product evolution and adaptability has differentiated the Chilean wine sector from those in other countries (Gwynne, 2008).

As a result this survey of wine companies will not only interview the lead entrepreneurs but also some of those who have been involved in the process of innovation in winemaking and estate management. The argument is that it has been the success in combining these knowledges which has differentiated the dynamic export-oriented wine firm from those which have found it difficult to expand into export markets. The research further argues that the Colchagua Valley has a large number of these dynamic, export-oriented firms and that for this reason it could be seen as an interesting example of a wine-producing industrial district, similar to the more famous industrial districts built on high technology sectors.

Punch (2000) believes interviews are ‘a powerful research tool ... capable of producing rich and valuable data’ and Valentine (1997) further asserts interviews as a method of research appropriate where depth is required and when the investigation attempts to explicate complex relationships. Critics of this method of data collection commonly raise issues of researcher bias, subjectivity, reliability, and validity. However, this approach was warranted as the research hypothesis involved gathering rich and multi-layered information allowing pre-prepared questions to form the skeleton of the interview whilst allowing auxiliary questions to be asked to aid further insight and deeper analysis (Hoggart et al, 2002). On the following page there is a list of the pre-prepared questions as a separate table

Semi-structured interviews were chosen. The conversational-style characteristic of this type of interview gives room to expand on interesting topics which may arise. Kitchin and Tate (2000) see this interview strategy as a mixture of a 'structured open-ended interview' and an 'interview guide approach'. This approach allows the interviewees to be guided by pre-determined questions whilst at the same time having freedom to digress. Issues can be thoroughly explored, explaining complexities and contradictions of

Tabla Uno: Preguntas para empresarios en el sector vitivinícola

- 1) ¿Puedes contarme sobre su carrera en el sector vitivinícola?**
- 2) ¿Como se originó y como se desarrolló su negocio?**
- 3) ¿Que piden las compañías compradores internacionales en términos de innovaciones?**
- 4) ¿Cuales han sido los factores que han fomentado el negocio y que factores han sido de restricción?**
- 5) ¿Cual es la restricción mas importante que has enfrentado y cual fue/ es su sugerencia para vencerla?**
- 6) ¿Cual es su disposición real a integrar la innovación a su empresa y cuales son los riesgos percibes?**
- 7) ¿Como ves la innovación en la Denominación de Origen (Colchagua o Casablanca) y que piensas de la heterogeneidad en el valle?**
- 8) Como se puede caracterizar la cadena de valor de vino entre Chile y países Asiáticos. EEUU y Europa?**
- 9) ¿Como ve las etapas en el sector vitivinícola en los últimos 30 años?**
- 10) ¿Que crees tú que va a pasar con el mercado de vino este año?**
- 11) ¿Que es el problema más grande actual para el sector?**
- 12) ¿Pensamientos generales del sector?**

experiences, allowing the production of a rich and multi-layered picture (Valentine, 1997). The semi-structured style allows time to explore issues without restrictions on the answers and questions given. Jankowicz (2000) discusses how this type of interview allows the topic of discussion to be reformulated or overlooked for the next respondent, thereby remaining sensitive to the interaction with the individuals.

It is important to have the basic set of questions in mind to gain coherence between those interviewed in the wine sector. By pre-determining questions, the comparability of responses will be increased and the interviewer's effects and biases reduced (Kitchin and Tate, 2000). As the pre-determined questions will form the skeleton for the interview, auxiliary questions allow for further insight and deeper analysis. Non directive questions are used to probe sensitive issues; for example, "puedes contarme sobre su carrera en el sector vitivinícola" or "como se desarrolló su negocio?" Burns (2000) discusses the advantages of semi-structured interviewing, proposing that it makes both the interviewer and interviewee more comfortable as the interviewee can answer in their own words instead of being forced to choose from a series of answers that the researcher has given. It allows for a deeper answer than a structured questionnaire type interview would provide.

In this analysis, we had a total of 15 interviewees with six being Chief Executive Officer of the company in question. In addition we had an interview with the Gerente General of the Asociación de Viñas de Colchagua. This left six interviews for both estate management (Oscar Valenzuela, Eugenio Cox and Pablo Lapostol) and for export manager (Cristián Fernandez, Carlos Serrano and Juan Sotto), which led into our analysis of how these managers responded with innovations in both estate management and in

terms of finding and developing new brands internationally. Finally there were two winemakers who were interviewed as well.

Table 2: People Interviewed as Part of Review

Viña	Cargo	Entrevistado	Situación	Transcripción	Res
Asociación de Viñas de Colchagua	Gerente General	Tomas Wilkins	Entrevistado	Español	Robe
Montgras	Gerente General	Patricio Middleton	Entrevistado	Ingles	Robe
Montgras	Estate Manager	Oscar Valenzuela	Entrevistado	Español	Robe
Luis Felipe Edwards	Gerente General	Luis Felipe Edwards	Entrevistado	Español	Robe
Luis Felipe Edwards	Estate Manager	Eugenio Cox	Entrevistado	Español	Robe
Viña Siegel, Valle Colchagua	Gerente General	Alberto Siegel	Entrevistado	Español	Robe
Viña Siegel, Valle Colchagua	Estate Manager	Pablo Lapostol	Entrevistado	Español	Robe
Viu Manent, Valle Colchagua	Enólogo	Grant Phelps	Entrevistado	Ingles	Robe
Santa Rita, Valle Colchagua	Export Director	Cristobal Fernandez	Entrevistado	Español	Robe
Casa Lapostolle	Gerente General	Patricio Eguiguren	Entrevistado	Ingles	Robe
Montes, Valle de Colchagua	Export Director	Carlos Serrano	Entrevistado	Ingles	Robe
Emiliana, Valle de Colchagua	Enologo	Antonio Bravo	Entrevistado	Ingles	Robe
Casa del Bosque, Casablanca	Export Director	Juan Sotto	Entrevistado	Español	Robe
Viña Bisquertt	Vice-President	Sebastian Bisquertt	Entrevistado	Español	Robe
Viña Maghten	Gerente General	Jose Luis Honoroso	Entrevistado	Español	Robe

Phases in Chile's dynamic wine industry

Chile has a long history in winemaking and in wine exporting. Although wine has been made in Chile since the sixteenth century it was not until the 1850s that a new breed of Chilean landowners, who had developed fortunes in the mining sector, started to import quality French wines. When French wine production was severely hit by the phylloxera aphid in the last third of the nineteenth century, quality Chilean wine came to be exported in significant quantities to France and other European markets. Many of the Bordeaux varieties came to be introduced into Chile – Cabernet Sauvignon, Cabernet Franc, Merlot and Carmenère. Vineyard concentration occurred within the fertile central valley stretching south from Maipo to the Maule valley.

However, after about 1915 Chilean wine exports declined and production focused increasingly on the small domestic market. By 1972, quality wine exports were down to only US\$1.8mn. (Banco Central, 1983: 244). Little investment had been made in either vineyards or wineries for much of the twentieth century. Wine was still largely made without reference to new technologies or new ideas.

The shift in Chile to a more open economy in the Pinochet dictatorship did not have an immediate impact in the wine sector in terms of rectifying the long history of underinvestment and focusing on the domestic market. Between 1972 and 1979, Wine exports rose to about US\$21mn in the latter year (Banco Central, 1982). However this was to be a “false alarm” as exports then declined and did not reach US\$23mn until 9 years later in 1988 (Banco Central, 1990). This was partly because under the dictatorship Chile had a negative image abroad with some consumers boycotting products from the country. Nevertheless, deregulation of the wine sector in the late 1970’s meant that pioneers such as the Spaniard, Miguel Torres, were free to plant new vines and upgrade the process involved leading the to the more liberal wine production stage that Chile is currently in.

Since the 1990s, however, export growth has been growing very rapidly indeed. If one compares the US\$17.9bn of quality wine exports in 1988 with the quality wine exports of US\$1,012mn in 2007, then one has a factor of over 56 times over 19 years to contend with. This is the biggest change in Chile’s wine exports that has yet been experienced.

Bulk and other wine accounted for an additional US\$233.5mn of exports in that year making a total export value of US\$1245.6mn in 2007 (Banco Central, 2008). Wine has thus become the fastest growing sector in terms of exports in the democratic period. In 1989 only 7 per cent of Chilean wine was exported but by 2007 the percentage had risen to around 70 per cent in terms of litres produced.

Chile possesses a whole range of comparative advantages in terms of vineyards and wine production. Chilean wine is presently produced within a huge range of latitudes – from the Elqui wine region at 30°S to the Malleco valley and Traiguén at over 38°S. Within these more than eight degrees of latitude, there are already thirteen wine regions and sub-regions with significant exports defined, each with a different combination of terroir in terms of climate, soils and local growing conditions. Chile has good solar exposure, frequent winds, low ambient humidity and rainfall, as well as geographical isolation (which kept away the phylloxera bug). All of these factors help reduce the incidence of pests and diseases, giving Chile a reputation for relatively trouble-free viticulture.

Most of these wine regions are defined according to the advancing latitudes but two regions break this pattern – the Casablanca and San Antonio (or Leyda) valleys. These are effectively coastal wine regions between the Maipo wine region and the coast. This introduces a relatively new theme to the comparative advantage and terroir of Chile for producing wine as both these regions are eminently white wine regions (with some Pinot Noir as well). The east to west variation is governed largely by the impact of coastal fogs

and cloud cover in the morning. Coastal wine regions (as with Casablanca) have not only cooler summer temperatures but also longer growing seasons (see Map Two).

Meanwhile, the heartland of Chilean wine production is now changing considerably but tends to follow well-established west-to-east valleys to the south of Santiago. The Colchagua Valley stretches from very near the coast (at Navidad or at Paradones) into the central crux of the region in Santa Cruz and then onto the foothills of the Andes near Chimbarongo (see Map 3). Much of this land is now well irrigated but requires a large amount of good irrigation near the sea. Furthermore, inland it tends to get much hotter during the day, but the warmer temperatures during the summer months still enjoys a great diurnal range in temperature of between 15 and 20 degrees Celsius. Such high diurnal variations in temperature during the summer months tend to produce quality grapes due to the concentration of fruit flavours that hot days and cool nights tend to generate.

Such a comparison of comparative advantage for vineyards generates the product composition possibility for the quality production of both white and red wines. As a general rule, quality white wines are produced nearer the coast and quality reds further inland away from the cooling effect of the sea. At present, the tradition of Chilean wine exports being dominated by red wine continues with about 70 per cent of exports characterised by red varietals. Cabernet Sauvignon, Merlot and Carmenère account for over 75 per cent of red wine exports; Syrah and Pinot Noir are coming up fast. Meanwhile, white wine exports are progressing rapidly, with Chardonnay, Sauvignon

Blanc and Gewurtztraminer being the three dominant varieties grown not only in the rapidly expanding coastal regions but also in the region to the far south of Chile – such as the Bio-Bio region.

Firm Creation

This research has worked with the twenty largest wine firms in 2007 in Chile in terms of exports of bottled wine to all world markets (see Table Three on the next page). They all correspond to those exporters that had more than US\$14mn of exports to all global markets in 2007. On the right hand side there is the important price per litre sold in 2007. Of the twenty companies, there are ten based in the Colchagua region – Cono Sur, Santa Rita, Montes, Santa Helena, Los Vascos, Viñedos Emiliana, Luis Felipe Edwards, Montgras, Casa Lapostolle and Corpora. Some are controlled by just one company. There were no wineries based completely in the Casablanca region. Some of the wineries control more than one company such as the Concha y Toro enterprise. They control Concha y Toro, Cono Sur, Maipo and Viñedos Emiliana – equivalent to US\$334.8mn in export values in 2007 or equivalent to 31 per cent of the total.

Let us also look to the export prices on the right hand side. There are six wineries with over 4\$ per litre in 2007. On the one hand, they are the key exporters owned by foreign companies – Los Vascos (Rothschild of France) and Casa Lapostolle (owned by the Marnier Lapostolle group of France). In addition there is the Montes group, the Errazuriz group, and the Santa Rita and Carmen groups – all from Chile although Santa Rita controls the Carmen group as well.

Table Three: The record of bottled wine exports from Chile's main twenty wine companies, 2007

Wine Firm and 2007 Export Rank	Year Firm Started	Export Value \$mn 2007	Export Volume (mn litres) 2007	Price per litre (US\$) 2007
1. Concha y Toro	1883	239.3	88.5	2.70
2. Cono Sur	1993	57.2	22.6	2.53
3. San Pedro	1865	56.7	23.1	2.45
4. Santa Rita	1880	50.2	11.5	4.36
5. Montes	1988	37.7	6.2	6.08
6. Santa Carolina	1875	29.8	11.1	2.69
7. Errazuriz	1870	28.6	4.9	5.84
8. Tarapaca	1874	24.5	7,5	3.27
9. Ventisquero	1998	23.7	7.9	3.00
10. Undurraga	1885	22.2	7.1	3.13
11. Via	1998	21.8	8.9	2.45
12. Luis Felipe Edwards	1976	21.5	8.5	2.53
13. Maipo	1948	20.2	9.4	2.15
14. Santa Helena	1942	20.1	8.5	2.36
15. Carmen	1850	19.3	4.5	4.29
16. Emiliana	1986	18.1	7.3	2.48
17. Montgras	1992	16.6	4.8	3.46
18. Corpora	1989	16.4	4.2	3,9
19. Los Vascos	1975	16.2	3.4	4.77
20. Casa Lapostolle	1994	14.9	1.9	7.84

Then we look at the times in which these businesses were created. There are twenty firms with dates. A large number (8) were created in the late nineteenth century – Concha y Toro, San Pedro, Santa Rita, Santa Carolina, Errazuriz, Undurraga, Tarapaca and Carmen. And then another 10 were created between 1976 and 1998 – Cono Sur, Montes, Via, Ventisquero, Los Vascos, Viñedos Emiliana, Luis Felipe Edwards, Montgras, Casa Lapostolle and Corpora. In other words virtually half of the companies come from the nineteenth century and the other half from the export boom of the late twentieth century (see Table Three).

It is important to address how the portfolio of Chilean firms today came into being. There were certainly significant gaps between the shift to neoliberal policy of the military government in the 1970s and the arrival of an outward-oriented sector. In the 1980s Gwynne (2006) argues that this change was due to the ever increasing debt burden of Latin American countries. It may also be due to the fact that more financial support was offered to countries entering this economic phase supported by the International Monetary Fund and the World Bank (Gereffi et al, 2005).

One of the major factors contributing to this decline was the economic crisis of 1982-3. The Chilean economy declined by 14% as the Chilean currency became seriously over-valued, over-production occurred, and a slump in the economy (Gwynne, 2006). Furthermore, the opening of the Chilean market to global forces proved too much competition for the companies used to producing for the small domestic market (Chile's population was only 11 million in 1982). Middleton (2008) says the global market proved too competitive for these companies and less state subsidies also meant some firms could

not endure the changes. The effect of this decrease was consolidation of Chilean wine firms, with the larger wine firms buying up the smaller, struggling companies. There were as many as eighty wine firms at the start of the 1980's and by the end of the 1980s this number had decreased to 15 (Arnold et al, 2002). It should be noted that at this time there were very few firms producing wine in the Casablanca valley, so this decrease in wine is an occurrence only in the Colchagua Valley.

In the 1990's firm numbers started to increase again. At the start of 1991 Middleton (2008) states there were 14 firms exporting wine in Chile and now, in 2008, that figure has reached 250. This expansion is shown not only by the increase in number of firms but also by the growth in exports sales from \$20 million in bottle sales to total exports of over \$1000 million in 2007. The reasons for this proliferation of firms can be put down to a varying number of factors; economic, political, consumer trends and exogenous factors.

Economically Chile had become an increasing power again; since 1986 the economy had grown by 6.7% a year (Gwynne, 2006), giving actors the confidence they needed to invest. Additionally, it was only from the 1990's that foreign firms started investing in Chilean wineries (with the exception of Miguel Torres). Examples of companies investing are Rothschild in Los Vascos winery in Colchagua Valley, and William Stevens Cole and French investment in Villard in Casablanca Valley. This increase in foreign capital meant that there was easier access to better price ranges, better channels of distribution and new technology (Olavarria et al, 2008, Gwynne, 2008a). Actors seeing the advantages given to both valleys from foreign influences, led to an increase in wineries as actors competed to gain access to these influences for themselves.

A political factor is the move towards 'pragmatic neo-liberalism' in 1984. As Gwynne (2006) points out, the government had kept an influence previously on the Chilean economy by keeping the peso fixed against the dollar, so true neoliberal policies did not actually start until 1984. This meant that from this time onwards the true advantages of neo-liberalism could be felt. Firm presence in Colchagua and Casablanca increased as actors recognised their freedom to tap into global sources of wealth.

Another political factor causing the increase of firms was the transition to democracy that Chile underwent at the end of the 1990's. This transition to democracy meant that global consumers who had previously boycotted Chilean products, due to human rights issues arising from the military regime, were willing to buy Chilean products again. Although, the percentage of consumers who boycotted Chilean products is not known, it is definitely known that human rights abuses by the regime were denounced on a global scale. This meant that sales increased, encouraging creation of new firms to meet this demand.

Consumers had a further influence on the creation of firms in Chile, owing to the fact that in this period there was a switch in consumer trends, leaning towards the consumption of red wines (Arnold et al, 2002). Chile is traditionally known for its red wine varieties, with 76% of Colchagua grapes being red wines (Olavarria et al, 2006). Owing to this increased global demand of red varieties, firms were set up to take advantage of this in a country known for its ability to produce good red wines. Consumers also changed their consumption patterns in that they were more willing to purchase wines that did not

originate from the traditional wine producing spheres. Consumer trends of demanding more quality wine than table wine will also have made actors desire to set up a firm to take advantage of higher values in the wine industry.

Exogenous factors can also be used to explain the increase in firms in the 1990's in Chile. Australia and California had an effect owing to their deficit of grapes. This meant both countries bought grapes from Chile, increasing grape prices from 400% and encouraging further planting there (Arnold et al, 2002). In an interview Bisquertt, CEO of Viña Bisquertt in Colchagua, said that around this period Rothschild came to Chile, encouraging actors that Chile could make a lot of money from wine exports. The technological revolution that had occurred in Australia and California (Gwynne, 2006 & Jadresic, 2008) influenced Chile to try to use these new techniques and it is arguably the revolution made actors perceive the wine industry to be a more accessible sector. One of the most important factors of the technological revolution is that it increased people's knowledge of the effects of climate on wine-making. This led to an examination of the different climates within Chile and the first plantings in Casablanca, where the climate is perfect for white wines due to cold fogs that come in from the sea (Sotta, 2008).

It is important here to note a differentiation between the two valleys under study. Table 3 demonstrates that Casablanca Valley has a higher percentage of companies set up in the 1990s, whereas in Colchagua Valley there are a higher percentage of firms set up before this time. Where companies were set up before this period of rejuvenation, all in Colchagua, these firms did not start export on a large scale until two decades ago. The

wineries needed time to rebuild and reconsolidate, it was only in the mid- 1980's when they started to focus on moving forward, instead of just recovering lost ground. It was at this time they started focusing on exports and better quality (Bisquertt, 2008, Siegel, 2008).

Table Four - Firm Creation and exportation in the Casablanca and Colchagua valleys

Source: Interview data

Casablanca Valley		Colchagua Valley		
Firm	Year set up	Firm	Year set up	Year export started
Veramonte	1990	Montes	1987	1988
Viña Mar	2002	Luis Felipe Edwards	1975	1994
Casablanca	1993	Casa Lapostolle	1984	1984
Villard	1989	Bisquertt	1960's	1985
Casas del bosque	1993	Viu Manent	1935	1991
		Siegel	1980	1997

The effect of an increase of firms, mostly outward orientated, meant that the government had to replace the Wine Law of 1995. This wine law created the laws of 'Denominación de Origen', that split Chile into 13 legally recognised regions. This law meant that Chile as a country fitted in with EU regulations. The technological revolution that was seen in Australia and the United States was also seen in Chile due to increasing number of firms

investing in the market. The impact of the entrance of these New World producers was felt strongly by the quality wine producers of the Old World. The Old World had always produced wines that sold the wine through its 'terroir', the unique soil and climate of a region. However, in the New World lack of regulations meant the production process could be experimented with and wines became based on just one or at most two grape varieties, which were clearly stated on the packaging of quality wines.

It is interesting to note that neo-liberalism has led, in many countries, to more influence from foreign companies. This was an effect that passed Chile over. Gwynne (2006a) shows that of the largest 16 wineries in Colchagua only one or two are fully owned by foreign companies and Olavarria et al (2008) show that 87% of investment in Colchagua is national capital. It should be noted here that Casablanca has a higher influence of foreign investment with two of the six wineries from whom information was obtained are wholly or partly owned by foreign companies (William Cole and Villard). Of the remaining four, three of the companies were set up by existing Chilean firms wanting to expand their business.

When interviewees were asked about the future of the wine sector as a whole an interesting number of firms suggested that in the near future there could actually be a drop in the number of actors in viticulture in the Colchagua valley. As the Managing Director of Casa Lapostolle, Patricio Eguiguren, pointed out in the 1990's with the boom in the industry a lot of firms entered the industry but it did not necessarily mean they had the technological knowledge to make wines. Eguiguren then explains why these vineyards set up in the 1990's are going bust now:

“In a vineyard people don’t do that [sell immediately when without profit], they say no this is a long term investment. We will wait but after so many years without profit you have to stop and sell it” (pg 5, 2008).

Another reason for the predicted fall in companies was given to problems of the exchange rate. Serrano (2008), from Montes, suggests that wineries that cannot increase their efficiency and or prices will have to sell up.

The consolidation of distribution channels meaning small and medium players cannot access the market and fail in the face of competition (Arnold et al, 2002). In the U.S the number of wholesalers has shrunk by 73% and one third of all wine there is sold through just 5 wholesalers. A similar trend is seen in the U.K. where the dominant distributors are the supermarkets with 60% of wine volume and Norway where 100% of wine is sold through the two leading distributors (Sánchez, 2004).

An effect of this decrease in wine firms will be the consolidation of bigger wineries as Phelps (2008) explains San Pedro winery is taking over the two companies of Leyda and Tabali, and Eguiguren (2008) gives the example of Concha y Toro, Chile’s biggest wine firm, taking over the Francisco winery in the North. This is surely not a positive prediction considering 40% of exports (in value) are already under the control of three big Chilean firms; Concha y Toro, San Pedro y Santa Rita (Arnold et al, 2002).

One could predict that as Casablanca is still increasing grapes under vine, there has been a rise from 2500 hectares of land under wine grapes in 1998 to 4115 hectares in 2006 (Wines of Chile, 2008), and because of several interviewees from the Colchagua valley

stating their aim to plant in other regions in the near future, we should still see an ever increasing number of wineries in this region.

What then are the basic lessons from studying the mode of firm creation. First, half of the companies come from the late nineteenth centuries and half come from the late twentieth century. The ones from the late twentieth century tend to be more driven by giving help to the key supermarkets in their key destinations. Cono Sur, for example, the most recent company to be in the top three relies heavily on the UK market with approximately ?? percentage in the UK. Secondly, the prominence of low labour costs together with the great range of environments has had something to do with the creation of this interesting range of firms. Thirdly it was in the 1990s that there was a major investment in the wineries of most of the regions under study.

The strategic evolution of firms

Firm creation and firm restructuring for sales in exterior markets has been demonstrated to have occurred in the 1990's but how have these firms changed and developed from this time to the present day? How have they gained their success in the global market in which Chile has the fifth highest export value in the world (Olavarria et al, 2008)? To address this I will focus on why these firms needed to develop, the different innovations companies carried out for diversification, the risks they perceived as they undertook this innovation and the problems they face now that they will need to find strategies to overcome in the future.

The transition to open market economies in Chile gave these newly created, or newly exporting wine firms in Chile the chance to produce for the global market but the challenge faced by Chile's wine sector was the ability to produce a *competitive* product for the global market (Gwynne, 2004). Humphrey (2006) says that to be competitive one needs to upgrade a product; innovate to differentiate. A differentiated product is harder to be found elsewhere so therefore it becomes more competitive in the global market.

Another reason for firms to innovate and improve their product is to increase the value added on the global value chain. The global value chain is the market processes that connect the spheres of production, often in a semi-peripheral country, to the spheres of consumption, in core economies (Gwynne, 2008c). In this chain there is an overwhelmingly disproportional amount of power and value added in the 'downstream' of the chain, that of the supermarkets in the core economies. As much as 79% of Chilean wine in the U.K is sold in the off-trade, and of this 70% is sold via the top four supermarkets (Gwynne, 2008b). Firms need to differentiate and innovate so that they can stand out amongst the huge number of suppliers to these big chains. As Alberto Siegel from Siegel winery says:

“Everyone knows how hard it is to sell a bottle of wine in a supermarket in which there are lots of alternatives to choose from, a company has to be always innovating, or offering a new product or becoming a better known winery” (Pg 3, 2008, translated by author)¹

¹ “Todos saben cuanto cuesta a vender una botella de vino en un supermercado en que hay muchas alternativas para elegir, una empresa siempre tiene que estar inovando – o ofreciendo un producto nuevo o que la viña sea mas conocida.”

As Gwynne (2008a) says firms are also required to innovate as supermarkets nowadays, instead of just reselling a product, actively seek out or demand a certain type or characteristic of a product. For a firm of the semi-periphery to survive in this competitive global market they need to respond from any diffusion of knowledge a distributor offers about consumer demands (Gwynne,2008a). It is indisputable that innovation is important in the evolution and survival of firms, shown by the fact that 70% of firms in Colchagua think innovation in both process and product is important (Olavarria et al, 2008).

The innovations carried out by these companies can be split into three sections: innovations to improve the product via product upgrading in the winery; innovations to improve the product via process upgrading; and innovations to improve the product through branding and marketing.

Product upgrading

The traditional style of Chilean winemaking was common as recently as the eighties. A chronic lack of investment together with an insular mentality meant that winemaking for many Chileans was a crude and haphazard business (Richards, 2006: 30). Pressing was quick and brutal, fermentations were short and hot, maceration times were kept to a minimum for fear of bacterial spoilage and filtering was conducted as early and comprehensively as possible.

It was not until the eighties that things began to change. The man credited with the change is the Spanish winemaker Miguel Torres, who imported modern winemaking technology such as stainless-steel tanks and pneumatic presses. His example of rigorous

cellar hygiene, making white wines reductively, gentle pressing, and temperature-controlled fermentations proved influential (Richards, 2006: 31). These processes became widely disseminated through the 1980s and 1990s so that the 1990s can be seen as the decade of significant change in the sector. According to Lapostol (2008), the need to delay the fermentation in order for it to be slow, especially for white wines, was one of the more important inventions, particularly for wines with aromas.

For Cox (2008) the most significant changes have been in terms of Colchagua's two new wines, Syrah and Carmenère, on its Luis Felipe Edwards estate near Nancagua. Cox has planted Syrah on a range of 800 hectares of hilly land in their property in Colchagua, broadly similar to those in the Rhone valley, and later deciding to store it in oak barrels. Meanwhile, Carmenère, which has become the signature grape of Chile, does well on the more granitic and more fertile soils at the base of the hills and near to the company's cellar. Meanwhile, the traditional survivor, Cabernet Sauvignon, does well in both lower hills and plains as well. This was one of the most formidable new innovations in the Colchagua valley that I was able to see.

Grape quality has also been improved in wineries in both Colchagua and Casablanca using a vast range of new technologies. As much as 70 per cent of money spent on innovation in Colchagua has been spent on acquiring new machinery for the vinification process (Olavarria et al, 2008). An example in Casablanca valley is GPS (Global Positioning System) being used by Montes, Montgras and Casas del Bosque winery to work out the order in which grapes in the vineyard should be harvested.

If we go to Casa Lapostolle, which has the highest price per litre in Table Two.

Innovations in the ‘bodega’ (or winery) dominated in the 1990s and since then it has been more of the grapes themselves (see next section). Eguiguren (2008) thinks that today is a mix because in the winery you can also improve things to boost your wine. In Viu Manent, Grant Phelps (2008) thinks that it can depend on your philosophy as a wine maker. In Colchagua, most wineries are huge and many see wine as a commodity. They are not people who say that they are really proud of their wine. You have to have both a commercial and artistic side. “I am here because you can make great wines in Chile” (Phelps, 2008: 4). We need small wineries championing different styles.

Process upgrading:

It was not until the 1990s that a new viticultural era began, one that has radically altered the country’s wine-growing scene and brought about a new awareness of Chile’s vinous potential (Richards, 2006: 11). Between 1995 and 2000 when the country’s vineyard underwent a massive expansion, effectively doubling in size. Chilean viticulture pushed up into the hills and toward the country’s limits in all directions in the search for diversity – in the north (Elqui), the east (Andean Foothills), the south (Bio Bio) and west (Casablanca, San Antonio and parts of coastal Colchagua).

Water and irrigation are of increasing importance in Chilean viticulture. Irrigation is needed in most of the country’s vineyards because the growing season is so dry. In 2007/08 there was no rain from the end of July to a small amount of rain in February (Lapostol, 2008). During this period, those that did not have access to water suffered

considerably, and the Merlot grape in particular began to shrivel. This is an added problem for access to water in parts of the Casablanca valley and near the coast in Colchagua.

One form of upgrading to have taken place has been vertical integration of wine firms to increase their number of grapes coming from their own vineyards. This means that there can be more control on production processes and quality can increase. Some interviewees, for example Carlos Serrano from Montes, also complained about the unreliability of contract farmers so integration decreases these problems. Colchagua valley has 7,774 hectares of land planted and 80% of this land belongs to wineries, 11% is rented land from farmers and 9% of land is farmers land but which is supervised by the wineries buying the grapes (Olavarria et al, 2008).

A case study of upstream integration is Montes winery. Serrano (2008) talks about when the winery was set up in 1988 all grapes came from farmers, and in 1991 the company bought its first property in Apalta and started producing its own grapes. Montes later increased its vertical integration even more when a plot of land was bought in Marchihue. Now, in 2008, Montes has gone from 100% outsourcing of grapes to only 30%. Chilean firms have been able to do this because there is less state control in the agro- industry sector, meaning there are no restrictions on wineries buying land from farmers (Arnold et al, 2002).

It is interesting to note that Montes is not planning to integrate themselves further upstream and have 100% grapes produced as they will use this 30% contract farming to

buy grapes from other regions, where the terroir is better suited for different wines (such as Casablanca) than those produced in Colchagua. This is the same for high quality wine firm Montgras who want to decrease bought grapes from 45% to 20%, but want to keep this 20% contract farming to buy grapes from other valleys (Hamilton, 2008). Other companies, however, are increasing or planning to increase their integration upstream into other valleys instead of just contracts in these valleys, such as Luis Felipe Edwards (2008) and Casa Lapostolle.

In Casablanca evidence shows that vertical integration has not occurred to such an extent. Contract farmers are still used for two reasons. The first to make up volumes of grapes from farmers within Casablanca such as Viña Casablanca do. The second is to buy grapes from other valleys to make better red wines, a tactic used by both Veramonte and Casablanca winery. It will be interesting to see if in the future the wineries in Casablanca follow the lead of Indomita winery and buy an estate elsewhere to source the red wine grapes from.

Serrano (2008) claims that there has been a viticulturalists' revolution in the last four years as vineyard managers realised:

“In Chile we realised that it wasn't just Chile and it wasn't just Maipo or Colchagua. Each had its little spots and the viticulturists realised it and that planting there on that specific slope was not the same as over there. Also that planting Cabernet over there was not the same as planting Syrah.” (pg 6)

This has led to more and more science being used in the planting of vines in the vineyard.

Upgrading in Marketing and branding:

Analysis of the markets to which Chilean firms have aimed to sell their products is obviously important as it will have greatly affected their development as a company. Consumption of wine in the world is changing. Old World countries, such as France, have a declining consumption (Gwynne, 2008a and ODEPA, 2005), and also these countries tend to import less wine and instead drink nationally produced wine. Although France has the second largest consumption of wine, 55.2 litres per capita in 2005, it was only the ninth largest importer of wines in 2003 (Olavarria et al, 2008). Furthermore, some countries who traditionally did not consume vast quantities of wine are showing increasing consumption patterns. In Norway, for example, the total consumption between 1989 and 2002 rose by 65% and total annual spending per inhabitant rose by 60% (Sánchez, 2004). In the UK market growth per capita increased from 2.51 gallons in 1981 to 5.02 in 1999 (Arnold et al, 2002) and consumption is relatively 'open' (Gwynne, 2008b) in that they are prepared to consume an increasing range and variety of wines.

Table 4 shows the top 10 countries to whom Chile exported wine in 2007. One can see that the UK constitutes the main country with exports of over US\$230 million and at a median price of 2.27 dollars per litre. Germany and China generate much more imports in terms of liquid imported but their respective merits of \$1.2 for Germany and \$0.57 for China makes them the importers of very much the cheaper wine. In contrast, the US and Ireland at over \$3.0 per litre have a much higher quality than the average. This gives the background to the tremendous range of companies that Chilean wine can export to. In the middle, as the key market, is the UK with high sales but at reduced prices for each unit exported. Higher sales growth can be achieved for those exporting to the US and Irish

markets as with Casa Lapostolle and Montes – though each unit exported has higher mark-ups than in the very competitive UK industry. Meanwhile, for cheap wine, the targets are China and Germany.

Table Five: Principal export destinations for wine from Chile

Country	Exports (000 litres)	Exports (000 dollars FOB)	Price per litre
UK	101,680	230,584	2.27
USA	61,206	185,743	3.03
Germany	59,089	70,895	1.20
Canada	29,814	68,361	2.29
Denmark	28,609	55,614	1.94
Holland	22,471	54,233	2.41
Brazil	18,896	50,879	2.69
Ireland	12,183	43,890	3.60
China	70,658	40,196	0.57
Japan	15,772	36,393	2.31
Venezuela	17,914	33,290	1.86
Finland	12,122	33,135	2.73

Source: Wines of Chile (2008)

As you can see Chile has been highly successful in their establishment of export markets. They sell to eight of the ten highest importers in value terms, and of the two that are not in this category, Ireland has sales of over 100 million dollars and Brazil has sales of between \$50- \$100 million dollars (ODEPA, 2005). From interview data we can see that companies from both valleys are also aiming at emerging markets such as China (Bisquertt, Siegel, Casas del Bosque), Korea (Siegel, Bisquertt, Casas del Bosque), Russia (Luis Felipe Edwards) and India (Casas del Bosque).

Not only have Chilean firms aimed at the most emerging wine consumption markets, some Chilean firms have also been able to develop their brand successfully in certain

markets, through what Gereffi et al (2005) calls 'organizational success'. In this firms start at the lower end of the market and work up to the higher end with better quality and better prices. A prime example of this from the Colchagua valley came through interviews with Luis Felipe Edwards Junior (2008). The winery under the same name has been able to increase its sales from 70,000 cases in 2000 to one million cases last year (2007) and has invested significantly in vineyard estates.

This organizational success can be done by collaborating with supermarkets and creating a wine for their own label. This was done by Montgras with Sainsburys supermarket in the U.K (Middleton 2008). This is a good way to get oneself known by the supermarkets and also by the consumers. Tesco, Sainsbury and Asda spent 20 to 40 million pounds to promote their own brand labels in 2000, this is the kind of promotion that Chilean wineries cannot afford to spend (Chaney, 2004). However, firms like Cono Sur and Montgras, eventually broke out of these deals with supermarkets as there are low profit margins involved and high quality wines (where there is the highest value) cannot be sold this way.

User-driven and civic conventions of differentiation can be seen in both valleys (Gwynne, 2006a). The Wine Law of 1995 now means the 'Denominación de Origen' differentiates both valleys. Civic conventions have also been carried out in both valleys with Montgras in Colchagua becoming more organic (Valenzuela, 2008) and in Casablanca Villard winery recently received the ISO 14001 Certification, as recognition of their commitment to environmentally friendly agricultural practices.

It is clear that these innovations carried out have massively benefited the evolution of the companies surveyed. However, it is not without wariness that these innovations are implemented. The main risks being cited are the costs involved, carrying out innovations that will not improve quality, resistance to change and efficiency of personnel to carry out the changes involved. These perceived risks after being correlated with those found by Olavarria et al (2008) can be proven to be similar.

When the surveyed actors were asked what they thought were the main risks in the present day for their business, an evident problem encountered by all the firms in both valleys was the exchange rate. As Serrano (2008) says he remembers when the exchange rate was 740 to the dollar and today it is around 450. This has affected sales transactions carried out in dollars, especially for companies with big sales in the U.S, and with budget calculations done at the start of the year on a better exchange rate.

Another major problem that many wineries highlighted was the image Chile had outside of the country. Tourism in both valleys can promote the region but there is a definite emphasis on the need for government spending. Phelps (2008) from Viu Manent winery complains that Chile has only spent \$5 million on branding itself internationally, which if you compare it to inputs from the public sectors in other countries is very little.

Fernandez (2008) from Santa Rita winery says that the position of Chile needs to be made clearer; it can be backed up by an Interbrand study (Arnold et al, 2002) which showed that Chile, the country, barely had an image with overseas consumers, so this needs urgent investment. Furthermore, specialized customers should be targeted through

specialist wine magazines, to help this customer sector recognise the denominations of Colchagua and Casablanca (Bisquertt, 2008).

Some wineries also stated that finding a market for high quality wine was hard. This is especially due to imports of cheap Chilean bulk wines flooding some markets, like the UK. Consumers in these core economies believe this wine is of good quality and do not see the need to pay more for a higher quality wine. This problem can be combated by improvement of image, and as Siegel (2008) says the problems of exchange rate means companies cannot survive selling this way. Furthermore, ODEPA (2005), a governmental organization, found that the demand for high quality wines is ever increasing so it should become easier and easier to find a market for these wines.

A further problem was the increasing costs of labour and energy. Serrano says these costs have nearly increased by 50% in the last three years. This can be targeted by increasing quality of wines and therefore increased profits. This can also be done by increasing sales on the on-trade section of the market. Gwynne (2006) says only 21% of Chilean wine is sold in the on-trade but here the prices are higher and the image of the brand is improved. This area needs to be targeted by firms hoping to improve profits.

Innovation has been critical in a large number of areas in Chile's wine industry growth over the past eighteen years. The newer companies (those established in the last two decades of the twentieth century) have had a remit to go for organizational success in their overseas policy – starting by focusing on supermarkets and then gradually going up

market, With this, these firms have also gone up market in many “new” areas of the world.

At the same time, the companies have become less and less integrated with other producers in their area. With increasing vertical integration, all leading companies have been linked to a significant growth in planting and private sourcing, at least of their premium, super-premium and ultra-premium wines. With this result, the number of contracts with other producers has gradually lessened. Some of these producers are now buying in other valleys – so that there spread of wines (particularly in white versus red) can be no longer linked to just one valley.

Collaboration between firms in Clusters

Clusters were first written about in 1850 by Marshall as he theorized that firm agglomeration could cause reduced costs in production due to pools of specialized workers and a rapid diffusion of knowledge (Gibbon, 2001)

Clusters are important in the Chilean wine sector as although global producers can tell producers’ consumer demands, Gereffi et al (2005) says there is a strong connection between incorporation in local networks and innovation to reach a stronger firm position. Guthey (2008) also argues that these local networks are more important than economic competition as local learning and interfirm relations can help increase competitiveness by ‘competitive momentum’. Guthey also expresses the importance of the local nature of clusters. Clusters are created by unique relations and possibilities that occur under certain

conditions and cannot be equally fomented elsewhere. This is especially so in the wine sector where there is such 'place-based techno-scientific' activity.

So what are the factors in clusters and the innovation that occurs within them? Some within the clusterization literature (see examples in Giuliani, 2006) argue that geographical proximity is the key to firm successes in clusters. However, there are now many that say that physical proximity is not a sufficient reason to explain upgrading (Gibbon, 2001, Olavarria et al, 2008). Instead there has been a recent emphasis in literature of the importance of firms. Giuliani (2006: 143) says that firms should be considered as the central factor in clusters as their "meso-level conditions connect to the formation of innovation".

Giuliani goes on to hypothesise that firms with stronger knowledge basis will be the firms most central to the clusters (see later for verification of this hypothesis). The knowledge base of a firm, she argues, can be judged by individual education and practice of actors in a firm, experimentation in the company and linkages with firms outside of a cluster - Giuliani (2006) and Olavarria et al (2008). These knowledge bases shape the knowledge network that occurs in a cluster.

Using Colchagua as the example, Olavarria et al (2008) show that of the permanent workers working for vineyards in this valley 3 per cent have post graduate degrees, 10 per cent have superior education and the majority of workers (45 per cent) only have basic education (the equivalent of leaving school at 14 years). Even though this is higher than the knowledge of temporary workers, where 65 per cent have only basic education,

it must be noticed that these figures seem to be lower than those of permanent employees in the Napa valley in California found by Guthey (2008). Of the five companies he interviews highlighted in his study 3 have a superior education. This difference in education could be a disadvantage to cluster dynamics in Colchagua with less knowledge entering the cluster.

One practice adding to the knowledge base of a firm is that most producers have 10 years plus in the industry. As Guthey (2008) points out most of the actors interviewed in the Napa valley found that practical experience was far more essential than a degree. A factor that may increase a firm's knowledge base is experience in varying wine regions or wine producing countries giving knowledge of different global producers and competition. Serrano (2008) from Montes winery was given the opportunity to study in Bordeaux, California, and Auckland during a year long project, giving him knowledge of wine processes and firms in all of these countries. This is a definite area for future study.

There are approximately about 36 wineries at the moment in the Colchagua Valley. Within these there are at least twelve companies that have strong links together. For example in the area of Vineyard Estates Managers, there is a meeting (on average about once a month) between the 12 companies that are investing strongly in estates management (Valenzuela, 2008). These include companies that have invested in hills around their original properties (such as Montes, Casa Lapostolle, Luis Felipe Edwards and Montgras) in order to start the study of how best to develop hills surrounding the original properties. Other properties include Cono Sur (makes its locational decisions on a nation-wide parameter), Viu Manent, Bisquertt, Caliterra, Undurraga and Los Vascos.

Olavarria et al (2008) says that other factors affecting a firm's relationships in a cluster are its ability to absorb information, ability to transfer knowledge and company size. All these factors of knowledge affect a company's 'embeddedness' into a knowledge network (Giuliani, 2006). Higher embeddedness equals higher innovation. Firms with bigger knowledge bases are considered technological leaders and sought out by other companies if their own cognitive distance is not too high, hence they are more central in the networks and have a higher density of networks. Whereas firms with weak knowledge bases do not offer anything to other companies and neither do they have the ability to absorb knowledge (Giuliani, 2006).

Therefore the question of the extent to which firms within the two valleys of study exchange knowledge needs to be addressed. Three types of networks can be identified within a cluster:

- 1) Those of all communications within wineries of a valley.
- 2) Those of knowledge flows between wineries of a valley
- 3) Those of knowledge flows to wineries within the valleys but also sources outside valley such as suppliers, consultants etc

Both Giuliani (2006) and Olavarria et al (2008) show that the network with most linkages in Colchagua valley is the first network, both finding a density of linkages of 0.34.

Unfortunately these networks do not diffuse knowledge; if they were then knowledge would be distributed more evenly throughout firms in a cluster.

Network number 2, that of linkages dispersing knowledge to wineries within a valley, has a density of linkages of 0.12. This shows that there is less interaction between firms signifying that there is limited amount of knowledge flows. Both authors' findings show that in general firms with bigger knowledge bases were more involved with clusters and that as Olavarria et al (2008) suggested there is indeed a link between firm size and innovation. When carrying out the Pearson's chi squared test a value of 33,728 was produced for the relationship of size with innovation. This means that these two variables are related with 99% reliability. Thus proving a larger firm means more chances of innovation.

Olavarria et al (2008) and Giuliani (2006) differ in their findings on clusterization in the Colchagua valley in two terms: the sub-groups formed; and the knowledge bases and absorption capabilities of the key actors in these cliques. Giuliani finds that the sub-groups can be separated into a core and periphery demography, with the firms with the highest knowledge bases in the core with many linkages between each other. The peripheral firms consist of those with weak knowledge bases who only have a small density of linkages with few actors of the core and no links with other peripheral firms.

However, Olavarria et al (2008) find that there are in the network of knowledge flows between wineries in Colchagua a number of small subgroups made up of mainly of three of four connected nodes. Opposed to Giuliani (2006), the authors of Olavarria et al (2008) find heterogeneity in the most connected firms in terms of actors most central in the network. Of the five actors most central to this network in terms of grade of

centrality, for example, only three have high capabilities of innovation, the other two firms have low abilities.

In the third network of linkages between wineries in a cluster and actors outside the cluster Olavarria et al (2008) find a density of 0.036, showing there are few firms with many knowledge inputs from outside the cluster. This may of course reflect the nature of the investigations given that many knowledge inputs come from outside the cluster. Out-linkages occur with institutions of investigations and business associations. The links with business associations are of equal importance but links with institutions of investigations are preferential; firms linking mostly with highest preference of the 'Centro de Aromas' of the Pontificia Universidad Católica, then 'El Centro Tecnológico de la Vid y el Vino de la Universidad de Talca'. It is also important to note that not all firms have the same level of connection to these sources.

For the Casablanca valley there is no current economic study on clusterization, an obvious point for future research. As Olavarria et al (2008) point out a similar economic space for firms within one industry does not automatically make it a cluster; this could be the case for the Casablanca valley. However, there is evidence of a network between wineries in Casablanca in the 'Asociación de Empresarios Vitivinícolas de Casablanca'. This association is part of the tourist 'wine route' and incorporates eight of the wineries in this region.

A further point of future research in clusterization is whether Giuliani's (2006) 'preferential attachment' will occur. This being the scenario in which central firms keep

increasing their degree of centrality over time. This guarantee's the quality of knowledge diffused. However it may render cluster development reliable on a small number of firms.

Conclusion

It seems strange that innovation has become so closely linked to one particular Chilean sector without it either becoming obvious or apparent. Since the 1990s, however, export growth has been growing very rapidly indeed. If one compares the US\$17.9bn of quality wine exports in 1988 with the quality wine exports of US\$1,012mn in 2007, then one has a factor of over 56 times over 19 years to contend with. This is the biggest change in Chile's wine exports that has yet been experienced. Wine has thus become the fastest growing sector in terms of exports in the democratic period. In 1989 only 7 per cent of Chilean wine was exported but by 2007 the percentage had risen to around 70 per cent in terms of litres produced.

In terms of firm creation it has been the largest companies organised in the last two decades of the twentieth century that have been most significant. They have developed a useful plug into the downstream component of these chains. In particular companies have developed strategies of Gereffi's organizational success by targeting these main wine sectors first on the basis that each bottle of wine would receive only a small amount in terms of extra cash. Now after nearly four years of the peso increasing its value against the dollar, it is unlikely that this new type of wine product could be replaced again.

Furthermore, there have been companies like Casa Lapostolle and Montes that have used this window of opportunity as a way of introducing high quality wine (with little export of bulk or varietal wine) into the international arena.

As Humphrey and Schmitz (2002) pointed out, network relationships offer firms clearer opportunities for upgrading than in more hierarchical arrangements. This does mean that the Chilean wine sector may be rather unusual in that it is one of the few examples of significant upgrading and bargaining power being enjoyed by developing country firms within an agricultural or agro-industrial global value chain. Indeed Watts and Goodman (1997: 14) argued that in global commodity chains in agriculture and agro-industry, capital mobility has resulted in the centralization of power by retailers and suggested that developing country firms (and farms) within these commodity chains had even less bargaining power than developing country firms in the (clothing) manufacturing chains studied by Gereffi (1999).

In contrast, many Chilean wine firms have developed the competences to supply a range of supermarkets in an increasingly large number of countries. Rapid export growth has particularly occurred with those countries where the process of retail concentration has been significant. The Chilean wine producer has been able to establish a certain amount of bargaining power within the value chain, much more, for example, than large-scale farmers within Chile's fruit value chain (Gwynne, 2003).

Nevertheless, export-oriented wine firms have become highly dependent on the relationships they forge with large supermarket chains in core country markets. These supermarkets have been successful in the scramble for value, at least within the value chain linking Chilean producers with UK supermarkets. However, this value chain has provided a vehicle for rapid growth in export volume for many Chilean wine producers.

Value chain analysis is very much framed by the nature of the particular sector as it develops at the global scale (Friedland, 2005). Unlike global value chains in agriculture, wine provides an example of an agro-industrial value chain in which significant value-added can occur in the processing plant (winery). In contrast to such agricultural products as wheat or grapes where global exchanges tend to set prices, the wine sector has much greater flexibility in price setting and can potentially generate a huge variety of products. Prices have to be negotiated between producers and retailers rather than set in an exchange. The role of technological upgrading (through both product and process) becomes important as this can act to differentiate the final products of an exporting firm.

Innovation has been critical in a large number of areas in Chile's wine industry growth over the past eighteen years. The newer companies (those established in the last two decades of the twentieth century) have had a remit to go for organizational success in their overseas policy – starting by focusing on supermarkets and then gradually going up market. With this, these firms have also gone up market in many “new” areas of the world.

At the same time, the companies have become less and less integrated with other producers in their area. With increasing vertical integration, all leading companies have been linked to a significant growth in planting and private sourcing, at least of their premium, super-premium and ultra-premium wines. With this result, the number of contracts with other producers has gradually lessened. Some of these producers are now

buying in other valleys – so that there spread of wines (particularly in white versus red) can be no longer linked to just one valley.

Technological change has not only come from the classic Old World countries such as France that have always strongly influenced the style of Chilean wine production but also from New World countries such as Australia and New Zealand (Richards, 2006). Thus the geographical sources of information flows for research into new process and product technologies (such as France and Australia) are different from the main geographical sources of knowledges relating to sales and marketing (such as the UK). This is an example of Lagendijk's (2004) concept of interconnected locales. Places of winemaking in one country (which are spread along a 1,200 kilometre axis in Chile) are connected to places of exchange and consumption in another. At the same time, these places are connected to knowledge centres in other countries, such as the Pomerol region in France (where flying winemakers such as Michel Rolland are based) or the Adelaide region in Australia (home to Roseworthy, one of the world's leading wine universities, and another group of flying winemakers).

The 'systemworld' of the wine value chain thus not only links producing spaces with consuming spaces but also links these with the spaces that generate technology and the applied knowledges of wine. The systemworld also involves the 'cultural circuit' of the wine sector – wine associations, trade journals, websites, wine critics and journalists, scholars and experts. Some Chilean wine firms have been able to forge export growth by harnessing the potential of the cultural circuits as well as the value chains of the global wine sector.

A study of the clusters apparent in the two valleys led to the conclusion that more research was needed for the Casablanca valley. In the Colchagua valley various views were represented on the formation of the different sub groups or cliques, representing a conflict in the literature. The characteristic both authors (Olavarria et al, 2008; Giuliani, 2006) agreed on was that size mattered in innovation and density of linkages, with the smaller firms being those left to struggle to incorporate themselves into knowledge networks once again.

What all this demonstrates is that the future of small wineries in Chile may seem to be rather uncertain. Olavarria et al (2008) list some of the support available to this genre of wine firms but the reality is if these firms cannot innovate to differentiate themselves from the bigger wineries, there may well be the consolidation of producers that so many of the interviewee's predicted.

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