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COMPARATIVE NETWORKS AND CLUSTERS IN THE WINE INDUSTRY

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Comparative Networks and Clusters in the Wine Industry

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1. Introduction

This article addresses the nature of wine clusters in international perspective bringing together two separate literatures, the cluster/networks one and the one on the development of the wine industry, to analyze the mechanisms of innovation that have emerged in the sector. The study of innovation is often linked to economic clusters (Niosi 2005; Wolfe and Lucas 2004a; 2005), both as an analytical tool and as a policy option in the fostering of innovation and development (Feser, Renski, and Goldstein 2008; OECD 1999; 2002; Palazuelos 2005), even if not all effects of clustering are positive (Palazuelos 2005). The wine industry has received extensive attention through the use of cluster analysis (Alvarez 2007; Aylward 2004; Mytelka and Goertzen 2004; McDermott 2007; Hickton and Padmore 2005; Larreina and Aguado 2008). In general terms, clusters have been used in a broad multidisciplinary fashion and the approach has been applied to a host of issues (Boschma 2005; Malmberg and Power 2005) but this has also contributed to a reduction of its analytical sharpness and has fostered the emergence of different meanings for what should be similar concepts (Martin and Sunley 2003; see also Feser, Renski, and Goldstein 2008). However, we believe that cluster and network analysis can be used within the context of a multi-layered approach to the study of innovation policy in the wine industry. Clusters exhibit broad differences among them, by nation, by sector and by analytical approach and alongside them we often find networks. However, clusters and networks are different things with the latter embedded in the former. Both coalesce according to elective affinities, shared goals and layered interests among people. The fact that the clusters analyzed here are market clusters adds a powerful incentive to succeed, but also adds a high sensitivity on initial conditions.

Clusters coalesce geographically, while networks coalesce ideationally. This makes the latter a bit more flexible geographically: for example, global pipelines exist and networks of academics are relatively common if generally show low intensity. The 'quality' of the network embedded in the cluster may be the key to cluster success or at least a strong prerequisite of it (Eisingerich, Bell, and Tracey 2010). Therefore, we also argue that the relative degrees of success enjoyed by the various wine clusters reflect their ability to respond to shocks in the industry and the capacity of the institutional setting in which they exist to channel and foster some of the responses and activities generated by these shocks. Cluster theory offers some important fixed points from which the analysis of these agglomerations of actors can begin. Besides the notion
that clusters occupy a (sometimes difficult to define) geographical area, they are internally heterogeneous in terms of the actors that compose them. Along with a broad range of firms (suppliers, service providers, banks, and so forth) we find public entities like universities and government institutions. Actors establish both traded and untraded linkages with one another, and they do so within an area of geographical proximity.\textsuperscript{i}

In our analysis we are also cognizant of the fact that clusters and networks are not the sole level at which the process of innovation develops and that a multilevel approach that would include both regional systems of innovation and the national innovation policy from which many regulation, policy and economic dimensions depend (Aharonson, Baum, and Plunket 2008), is also critical in understanding the deployment of innovation. Regulation is going to affect both cluster structure (for example by creating specific organizations) and network capacity (by affecting the flow and ease of information). Regarding wine clusters, the above-noted characteristics apply with two provisos. First, the wine industry itself is highly dependant on a scarce supply of specific \textit{terroirs} placed within amenable climatic zones. Second, because tradition and quality are very important, the degree of innovation that the cluster may absorb could be different from that of other industries.

In the next section, we highlight the literature on innovation, and in section three we deal with the literature on the wine industry. In the successive section we explore the specific nature of the countries that we have chosen as subjects of our analysis: Australia, New Zealand, Canada, the United States, Argentina, Chile, France, Germany, Spain and South Africa. Finally, some conclusions are offered. Our sample covers most of the critically important old world producers, with the exclusion of Italy, and all of the important new world producers. The broad diversity in regulatory, legislative, policy and economic systems ensured by the scope of the sample is necessary to measure the effects these variables have on cluster performance.

\textbf{2. Innovation}

Research on innovation is a central part of the literature on economic development and public policy and is widely considered to be the key to increased and novel advantages (Gertler and Levitte 2005; Ibata-Arens 2008; Patzelt and Brenner 2008; Lonmo 2008; Niosi, Manseau, and
We define innovation as the result of deliberative processes by organizations, governments and others that add value to the economy or society by generating or recognizing potentially beneficial knowledge, and using such knowledge to improve products, services, processes or organizational forms.\footnote{Innovation is different from knowledge generation per se, since to comprise innovation, knowledge must be productively incorporated into the activities and outcomes of organizations, often using core resources and decision making processes, in order to enhance performance (Rogers 1962).} Within the context of innovation policy, cluster literature is often an important part of the analysis (Stanley 2007; Kern and Enzing 2006; Munn-Venn and Mitchell 2005; Tracey and Clark 2003; Moreno, Paci and Usai 2005). However, innovation and economic development go beyond the cluster level, and the latter must be correlated with both the regional systems of innovation and with national innovation systems that provide much of the policy and economic incentives (Aharonson, Baum, and Plunket 2008). At the analytically broadest level, the National Innovation System (NIS) addresses the larger framework and the infrastructural needs of national level approaches to innovation and economic development. This model has been used widely as backdrop for innovation studies (Arnold and Kuhlmann 2001; Stanley 2006). At a narrower level we find Regional Systems of Innovation (RSI), which are embedded within the larger national system and integrate regional specificities in its regulations and incentives. At an even more restricted level we find clusters and the networks that shape them. Innovation is often framed and fostered at the higher levels, but mostly occurs within clusters.
Because our analysis of innovation involves the uptake of biotechnology in wine clusters and because the study is framed in a comparative fashion, a multilayered approach would offer us a broader set of information on the application of advanced innovation to a traditional industry, especially in light of the symbiotic relation between the biotechnology industry and more traditional sectors (Robertson and Patle 2007).

Especially regarding advanced technology, like biotechnology, innovation networks have become a stable model for the diffusion of information and for the organization of the sector (Saviotti and Catherine 2008), and cluster literature has been applied liberally to the sector. However, it is unclear whether it may transfer to all context (Gertler and Levitte 2005; Rinaldi...
2006), in fact differences embedded in the various sectors closely link innovation policy to their specific realities.

Regarding issues like access to research and qualified personnel, for example, which are critical for the development of a successful cluster, simple policy will is likely to fall short. A national framework is very important, but it is far from being sufficient. Successful innovation systems depend on historical, social, political, financial, regulative and economic variables (Niosi, Manseau and Godin 2000). Therefore, the set of laws and incentives are important, but so is the orientation of the companies within the cluster that act in synergy to influence not only the cluster’s initial position, but its direction (Porter 1998).

The literature on clusters is very rich and here we combine two models developed by Pickernell, Rowe, Christie, and Brooksbank’s (2007) and Mytelka and Farinelli (2000) to build an analytical tool suited to our topic. Pickernell, Rowe, Christie, and Brooksbank (2007) describe eight ideal-type innovation systems and organize them according to the interactions among members of the network, and the nature of network linkages. The authors score actors in terms of firm focus, network mode, firm mode, management focus and learning focus and then map the clusters/networks on a space defined by the actors’ relationships and by their position in the industry. This analytical process results in a large number of different cluster types. These complex typologies are increasingly common in the literature, perhaps stemming from the diverse set of research agendas looking at relatively non-comparable sectors and from an effort to be comprehensive (Aylward 2004). We partially address this by using the classification proposed by Mytelka and Farinelli (2000), which reduces clusters typologies to three (informal, organized and innovative) according to the results of six independent variables they examine.

Table 1. Types of Spontaneous Clusters

<table>
<thead>
<tr>
<th>Critical Actors</th>
<th>Informal Clusters</th>
<th>Organized Clusters</th>
<th>Innovative Clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of Firms</td>
<td>Low</td>
<td>Low to medium</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Micro and small</td>
<td>SMEs</td>
<td>SMEs and large</td>
</tr>
<tr>
<td>Innovation</td>
<td>Little</td>
<td>Some</td>
<td>Continuous</td>
</tr>
<tr>
<td>Trust</td>
<td>Little</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Skills Technology</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Linkages</td>
<td>Some</td>
<td>Some</td>
<td>Extensive</td>
</tr>
<tr>
<td>Cooperation</td>
<td>Little</td>
<td>Some, not sustained</td>
<td>High</td>
</tr>
<tr>
<td>Competition</td>
<td>High</td>
<td>High</td>
<td>Medium to high</td>
</tr>
<tr>
<td>Product Change</td>
<td>Little or none</td>
<td>Some</td>
<td>Continuous</td>
</tr>
<tr>
<td>Exports</td>
<td>Little of none</td>
<td>Medium-high</td>
<td>High</td>
</tr>
</tbody>
</table>
Using this typology we can generate a matrix within which we organize the various cluster models shown by Pickernell, Rowe, Christie and Brooksbank (2007). Of particular importance to us are the type of learning processes, the network mode, and the management focus. This allows us to organize the clusters according to their propensity towards innovation, and thus we can move from the analysis of structural variables to the policy field and to the interactions among actors.

Table 2. Merged Cluster Types

<table>
<thead>
<tr>
<th>Cluster type</th>
<th>Informal Clusters</th>
<th>Organized Clusters</th>
<th>Innovative Clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Industrial complex</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2. Hub and spoke</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3. Italianate district</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>4. Marshallian</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5. Urban hierarchy</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6. Social network</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7. Virtual organisation</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>8. Satellite industrial platform</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We argue that not all clusters are equally suited to innovative processes. The type of cluster that exists in a certain sector will influence chances of innovative knowledge being produced, transmitted and applied through the cluster. Different network structures affect the transfer of knowledge (both in terms of how and what is transmitted) and the success of clusters.

Among the characteristics of a cluster, the locational aspect is an important one and it has been stressed in the literature (Park 2001) as it ensures access to resources that are critical for cluster development like skilled personnel, training and research facilities, and critical infrastructure (Padmore and Gibson 1997, Niosi 2005). This is of course particularly true of wine clusters.
because of the specificity attached to the agricultural requirements of the industry. As research progressively refined the original notion of cluster as a structure of innovation based on local or regional linkages among firms, governmental agencies and research centres, clusters’ boundaries were reassessed and found to spill over local and even regional boundaries (Visser and Atzema 2008: 1171). As a result, when we look at clusters we must deal with the specificity of localized resources and endowments, with the way in which the latter influence the nature of clusters, and with a loss of geographical ‘closeness’ among the actors in some clusters. This is reflected in the increasing emergence of non-cluster approaches (Visser and Atzema 2008) and in the increased relevance of the system of innovation model that manages to capture some of these ‘extra-cluster’ connections.

Research has also shown that different clusters have different characteristics (Niosi 2005), and that is especially true in terms of the way in which knowledge diffuses within them (Wolfe, Davis and Lucas 2005), reflecting in our opinion the nature of the networks that are embedded there. It is possible to distinguish between synthetic, analytical and mixed clusters depending on whether the knowledge base for the latter is based on utilizing existing knowledge that is tailored to the specific need, on using primarily scientific, codified knowledge or on mixing the two in a hybrid cluster, to develop innovative products and processes (Wolfe, Davis and Lucas 2005: 8-10).

Finally, it will be important to try to assess which stage in the ‘life-cycle’ of the cluster we are looking at. We chose to use the stages highlighted by Wolfe, Davis, and Lucas (2005: 7) and according to this model both the Okanagan and the Niagara wine clusters are established ones. An initial set of changes emerged in the 1970s with the restructuring of the industry in terms of products and in the number and type of wineries. A new turning point may be represented by the introduction of biotechnology in the industry and by the embracing of a more innovative business model.

3. Wine

With the emergence of the so called ‘New World’ producers starting in the 1970s and 1980s, the wine industry became an important addition to domestic and international markets for countries like Australia, New Zealand, the United States, and Chile. The study of the development of these new producers in terms of clusters is broadly diffused and it has been applied to a variety
of geographical and functional areas (Alvarez 2004; 2007; Bell and Giuliani 2007; Farinelli 2007). The most successful of these producers have been very much engaged in exporting their products and within them the most successful clusters are strongly correlated to this strategy (Aylward 2004; 2006). Others like Canada have lagged behind in their ability to establish a strong export market. The economic success of an export-oriented strategy has been evident in the case of New Zealand (NZW 2008), Australia (Aylward 2004; 2006), and Chile (Giuliani and Bell 2005). In the case of Australia, wine production has gone on to generate synergic links with the tourism industry (O’Neil, and Whatmore 1999). While in the case of New Zealand, the distribution of returns among industry players is heavily skewed (Stevens and Clayton 2008), the model still appears to be successful.

Aylward (2004) noted that while the organization of the wine industry naturally tended towards geographical clustering around specific areas where the vineyard were, “it was the desire to export, to expand markets, that triggered systemic organization” in new world producers that created a coordinated strategy that would comprise pricing, Research and Development (R&D), production, and marketing among other things (Aylward 2004: 425). The export strategy seems therefore to be importantly correlated to successful clusters. However, at least in the case of the US, which was the cradle of new world production, we do not find a particularly strong export orientation. Canada can also be counted among the new world producers that employed modern techniques in viticulture and wine-making, but here exports are at best marginal.

The research has noted that wine clusters are at very different levels in their development. Chile (Visser 2004) and Canada (Mytelka and Goertzen 2004; Hickton and Padmore 2005) are not as developed as the California (Porter and Bond 2004) or the Australian (Aylward 2004) ones.
<table>
<thead>
<tr>
<th>Country</th>
<th>Wine Production ('000 of hl)</th>
<th>Share of world exports ('000 of hl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>19,914 (6.54%)</td>
<td>15,588 (5.92%)</td>
</tr>
<tr>
<td>Australia</td>
<td>4,285 (1.40%)</td>
<td>4,810 (1.82%)</td>
</tr>
<tr>
<td>Canada</td>
<td>457 (0.15%)</td>
<td>324 (0.12%)</td>
</tr>
<tr>
<td>Chile</td>
<td>4,135 (1.36%)</td>
<td>3,326 (1.26%)</td>
</tr>
<tr>
<td>France</td>
<td>64,641 (21.25%)</td>
<td>52,886 (20.10%)</td>
</tr>
<tr>
<td>Germany</td>
<td>10,012 (3.29%)</td>
<td>10,391 (3.94%)</td>
</tr>
<tr>
<td>Italy</td>
<td>65,715 (21.60%)</td>
<td>60,768 (23.09%)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>439 (0.14%)</td>
<td>443 (0.16%)</td>
</tr>
<tr>
<td>Spain</td>
<td>33,519 (11.01%)</td>
<td>26,438 (10.04%)</td>
</tr>
<tr>
<td>South Africa</td>
<td>7,742 (2.54%)</td>
<td>8,228 (3.12%)</td>
</tr>
<tr>
<td>United States</td>
<td>18,167 (5.97%)</td>
<td>17,619 (6.69%)</td>
</tr>
<tr>
<td>World</td>
<td>304,192</td>
<td>263,092</td>
</tr>
</tbody>
</table>

Source: OIV (2006)
If there is any truth in the notion that a strong export orientation is at the root of a successful wine industry development as Aylward (2004; 2006) has noted we need a measure of export orientation. The table below indicates the percentage of domestic wine production that is exported by a select group of wine producing countries.

Table 4. Share of Wine Export as a Percentage of Total Production

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>1.11%</td>
<td>3.79%</td>
<td>7.63%</td>
<td>10.59%</td>
</tr>
<tr>
<td>Australia</td>
<td>5.81%</td>
<td>20.83%</td>
<td>28.29%</td>
<td>43.49%</td>
</tr>
<tr>
<td>Canada</td>
<td>2.19%</td>
<td>2.47%</td>
<td>4.46%</td>
<td>5.22%</td>
</tr>
<tr>
<td>Chile</td>
<td>4.42%</td>
<td>26.10%</td>
<td>44.39%</td>
<td>61.42%</td>
</tr>
<tr>
<td>France</td>
<td>19.76%</td>
<td>21.70%</td>
<td>27.14%</td>
<td>28.45%</td>
</tr>
<tr>
<td>Germany</td>
<td>27.11%</td>
<td>25.87%</td>
<td>23.32%</td>
<td>28.61%</td>
</tr>
<tr>
<td>Italy</td>
<td>19.10%</td>
<td>24.80%</td>
<td>27.26%</td>
<td>31.86%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>5.47%</td>
<td>16.93%</td>
<td>26.23%</td>
<td>36.32%</td>
</tr>
<tr>
<td>Spain</td>
<td>13.85%</td>
<td>27.81%</td>
<td>25.81%</td>
<td>32.35%</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.59%</td>
<td>4.51%</td>
<td>15.27%</td>
<td>29.40%</td>
</tr>
<tr>
<td>United States</td>
<td>3.36%</td>
<td>6.69%</td>
<td>11.35%</td>
<td>15.81%</td>
</tr>
</tbody>
</table>

Source: Authors calculation from OIV (2006)

We believe that a relatively simple measure of export orientation can be developed from these data based on the percentage of production that each country sells abroad. While this does not capture the quantity of wine exported this can be easily appended to the measure.

Table 5. Export Orientation

<table>
<thead>
<tr>
<th>Export Orientation</th>
<th>Non-Export Oriented</th>
<th>Weakly Export Oriented</th>
<th>Export Oriented</th>
<th>Strongly Export Oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of production exported</td>
<td>0-10%</td>
<td>11-25%</td>
<td>26-40%</td>
<td>Over 40%</td>
</tr>
</tbody>
</table>
The nature of many new world wine producers appears to be increasingly involved in exporting wine. The result is that among the countries noted in the sample above only Canada, Argentina, and the United States fall in the first two categories of non-export or weakly export oriented. At the opposite end of the spectrum are the results of countries like Chile and Australia. In the chart below, we have ordered the countries above for the period 2001-2005 in terms of export orientation and of the amount of exports.

Chart 1. Position of Wine Exporters in the World Market

Additional information on the same topic can be glimpsed by looking at the price per litre of export wines and to the index of comparative advantage of wine exports compiled by the Australian Wine and Brandy Corporation. This data is shown in Table 6 below and it indicates that between 1995 and 2005 three countries have been able to increase their comparative advantage in wine exports in a rather dramatic way (New Zealand, Chile and Australia) with France doing relatively well on the strength of its historical performance. Argentina and South Africa have shown some increase in their position but not an exceptional one. Italy and Spain have remained more or less at the same place and finally a group of three countries – Canada,
Germany and the United States – have a marginal advantage in wine exports. In terms of wine prices, the general increase reflects the higher quality products that are being offered (in the case of Canada especially the high importance of ice-wine in its tiny export market) and changing economic conditions.

Table 6. Wine Export Average Price per Litre and Wine Export Comparative Advantage Index

<table>
<thead>
<tr>
<th></th>
<th>1995 US$ per litre</th>
<th>Index</th>
<th>2000 US$ per litre</th>
<th>Index</th>
<th>2005 US$ per litre</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>$0.34</td>
<td>1.8</td>
<td>$1.55</td>
<td>2.9</td>
<td>$1.39</td>
<td>3.8</td>
</tr>
<tr>
<td>Australia</td>
<td>$2.60</td>
<td>2.7</td>
<td>$2.77</td>
<td>6.7</td>
<td>$3.03</td>
<td>10.2</td>
</tr>
<tr>
<td>Canada</td>
<td>$2.86</td>
<td>0.0</td>
<td>$2.72</td>
<td>0.0</td>
<td>$5.99</td>
<td>0.0</td>
</tr>
<tr>
<td>Chile</td>
<td>$1.41</td>
<td>5.4</td>
<td>$2.11</td>
<td>15.9</td>
<td>$2.10</td>
<td>10.7</td>
</tr>
<tr>
<td>France</td>
<td>$3.66</td>
<td>7.3</td>
<td>$3.11</td>
<td>7.9</td>
<td>$4.71</td>
<td>7.9</td>
</tr>
<tr>
<td>Germany</td>
<td>$1.82</td>
<td>0.5</td>
<td>$1.43</td>
<td>0.3</td>
<td>$2.35</td>
<td>0.4</td>
</tr>
<tr>
<td>Italy</td>
<td>$1.11</td>
<td>4.4</td>
<td>$1.22</td>
<td>4.8</td>
<td>$2.34</td>
<td>5.4</td>
</tr>
<tr>
<td>New Zealand</td>
<td>$3.44</td>
<td>0.9</td>
<td>$4.02</td>
<td>2.9</td>
<td>$6.46</td>
<td>7.8</td>
</tr>
<tr>
<td>Spain</td>
<td>$1.48</td>
<td>4.8</td>
<td>$1.25</td>
<td>5.3</td>
<td>$1.32</td>
<td>5.2</td>
</tr>
<tr>
<td>South Africa</td>
<td>$2.40</td>
<td>3.2</td>
<td>$1.73</td>
<td>4.0</td>
<td>$1.92</td>
<td>5.7</td>
</tr>
<tr>
<td>United States</td>
<td>$1.67</td>
<td>0.2</td>
<td>$1.89</td>
<td>0.3</td>
<td>$1.78</td>
<td>0.3</td>
</tr>
</tbody>
</table>


This brief overview of the world wine industry highlights the diversity of results in the various countries. We believe that the study of these producers from a cluster/network perspective can provide us with a more complete set of explanations for the differing dynamics of these sectors, especially if we remain mindful of the regulatory and policy differences that exist in these countries (Howlett and Migone 2010).
Case Studies

In the wine world market France, Italy and Spain remain the most important exporters and producers of wine. New world producers have made important advances in both quality and quantity of products and the industry itself has gone through important changes (OIV 2006). In recent years there has been a decline in planted areas as changing patterns of consumption, modifications in wine prices, stronger competition, and environmental conditions (for example the extended drought that has affected Australia) have led the industry to reduce the number of vineyards. Producers have increasingly focused on specific, highly marketable varietals. As a result the competition had increased and the activity of the most important wine producers has been affected. All the same, the economic structure of the wine industry does not seem to be the best possible match for a truly globalized model (Zalan 2005), rather presenting the characteristics of what Ghemawat (2003a; 2003b; 2007) called semiglobalization: a situation in which limits will remain for a while to the cross-border integration of economic systems and where firm activity and strategy will be critical in taking advantage of and in working with the residual ‘stickiness’ of the system.

Before we begin the analysis of the individual case studies a few words should be dedicated to the broader regional context. Notwithstanding the emphatic arrival of new world producers and consumers into the world wine markets, the European Union remains a critical player in the field. In 2008, through Regulation (EC) 479/2008 and Regulation (EC) 555/2008, the Council of Ministers of the European Union amended the wine Common Market Organization (CMO) in response to the ongoing challenges that the European wine industry has faced and set the goals to make the sector more competitive for example by reducing overproduction but also by eliminating a series of expansive EU measures that partially sustain the industry. As it does for other agricultural products, the EU purchases surplus wine production and distils it into alcohol to prevent prices from dropping too low. These subsidies will be rapidly phased out and reduced as funding for emergency distillation will fall from a maximum of 20% to maximum of 5% of the national funding budget over four years to 2012. The funding for the distillation into alcohol for use in spirits will also be phased out over four years. Of particular interest is the approach towards replacing vineyards with alternative crops. The original debate that had occurred in the EU for the reform of the wine CMO goes back to 2006 and the measures discussed included the reduction of the planted area of the 27 countries by as much as 400,000 hectares. The actual
numbers are smaller, the total area to be affected is closer to 175,000 hectares and it has a budget of over €1 billion distributed between 2009 and 2015. The process is aimed at reducing the surface planted with poorly marketable varietals by allowing farmers to replant vines and still qualify for the bridge funding if they uproot equivalent areas. Otherwise replanting is forbidden until 2015, although member states can extend this prohibition to 2018. Other goals are the restructuring of the chain of production, green harvesting (removing immature green bunches), and innovation. Other relevant novelties include changes in wine-making practices. Here the approval of new winemaking practices is being transferred to the Commission. Simpler labeling rules are also been introduced and these will based quality assessment on designations of origin and protected geographical indications. This change will not affect national quality-labeling approaches that are well established but the new rules will simplify the process and will allow labeling of both vintage and grape variety.

This process is very similar to the vision that led New Zealand to become a top producer of high quality wines. The question of whether the European Union will reap the same results is very much open. The highly different national and regional realities that the EU must deal with and the enormous volume differences argue against the mere replication of results. However, this appears to be an important first step in a process of rationalization of the industry.

The new world producers (those countries that have begun entering the wine scene in force in the 1970s and 1980s from locations other than Europe) have been an important source of inspiration and competition for their European competitors and for one another. Countries like Australia, New Zealand, Chile and United States have show remarkable capacity in developing successful wine sectors under different conditions and following independent strategic approaches. In this article we wish to assess what similarities, if any, exist among them in terms of strategic and institutional approaches. We noted above how one of the most obvious and debated points about the success of new world producers has been their export orientation (Aylward 2004; 2006; Gonuguntla 2009; Cusmano, Morrison and Rabellotti 2009). Another important distinction appears to rest with the degree of organization of the sector. Countries like Australia and areas like Napa Valley, where a strong organizational structure has been in place to foster growth and innovation have done better than others (Porter 1998; Porter and Bond 2004; Smith and Marsh 2007). In the next subsections we explore the nature of wine making in the countries included in our analysis.
As it has been the case for other Latin American countries, the production of wine in Argentina dates back to the early phases of Spanish colonization, with grapes being planted as far back as the 1540s (Robinson 2006). The best wine producing areas are located in the North-western part of the country, in the cooler and more rainy areas of the Andes’ foothills. The most important areas are Mendoza, where around 80% of the production is located, and the Salta region, which is also very promising in terms of quality. In terms of overall assessment, Argentinean wine is still struggling with some quality issues even as since the mid-1990s producers here have begun adjusting to the new model of wine development and started exploiting more marketable varietals like Chardonnay, Merlot, Cabernet Sauvignon, and Malbec. The activity of Argentinean producers in the export market has continued to grow in recent years, especially towards the US, which is an extremely important consumer and as recently as 2007 absorbed about 40% of the Latin American country’s production, but also in Great Britain and Canada (Stein 2008). Argentina appears to have followed in the footsteps of the Australian model focusing on satisfying the taste for novel wines that emerged in Anglo-Saxon countries and thereby privileging an export-oriented strategy (González 2004). This is a complete turnaround from the approach that the industry had followed until the 1970s, which was based on feeding a large domestic market that demanded relatively low quality, cheap products. Financial incentives led to massive production that resulted in low quality and large planted surfaces. As the domestic market began to shrink in the late 1980s, some of the more forward winemakers started to reshape the industry. The strategy of reconversión focused on an export-oriented approach, embracing new technologies in both wine making and viticulture, changes in the structure and approach of the industry, that would create a less fragmented sector and provide a more consumer-centered product (Stein 2008: 7-8). By 1990 the planted area was only about 20% of what it had been in the 1970s. However, the quality of the grapes was not the only issue: Argentinean wineries lacked modern technology and modern know-how. Change on a large scale was required and the industry embraced this change by increasing both the volume and value levels of its exports but especially by focusing on high quality wines. The industry was shaped by people like Nicolás Catena who as a post-doctoral student at UC Berkeley in the 1980s absorbed the lessons of the Napa Valley and brought those models to Argentina. The
understanding that fine wines would be an important factor in world consumption led Catena to explore a strategy that aimed straight away for a different price point, much higher than many other new world producers would charge (Foster 1995; Stein 2008). An important role was also played by foreign investors who in the 1990s could for the first time invest freely in the country. These investors, lured by the relatively stable economy of the 1990s, cheap labour and excellent terroirs, established very modern facilities that were focused on the export market. To complete the picture, European, American and Australian wine makers flocked to Argentina and helped reshape the enological bases of the industry.

It should be noted that in the midst of this change the Argentinean domestic market remained very important to the industry as in 2007 out of about 2,000 wineries only 400 exported their products and 60% of the country’s production was concentrated in 20 companies (Stein 2008: 18). While domestic production definitely decreased the demand for premium products rose and so did the price of domestically sold wines. Stein (2008) notes how the Argentinean industry displays a strong flexibility in its capacity to reshape itself and a keen understanding that balanced strategies are almost a necessity in a country that has had more than its share of crisis situations.

In regulatory terms Argentina has benefitted from a closer integration with the global economy that drew more foreign investment to its wine making sector. In the area of Denomination of Origin the lack of strict regulations like those that exist in Europe have been critical in allowing for more experimentation and have enabled the industry to tailor its products to market demand rather than to regulatory standards. The development of Malbec rather than Chardonnay or Cabernet Sauvignon for the American market is an example of this approach. The flexibility of Argentinean winemakers is also reflected in the increased attention to modern marketing and labelling techniques and to a strong branding approach that places the ‘Argentinean’ character of the country’s wines front and center. The wine sector is in many ways an unusual success in Argentinean economic development and the arms length approach of the government that allowed it to self regulate and opened it to international competition may have been very important in fostering its success (McDermott 2007). In the Mendoza and San Juan regions the government helped the growth of the wine industry by creating a set of institutional structures that provided “greater scope and scale of resources; program adaptation; and diffusion of
practices, standards, and contacts” (McDermott 2007:126). This took place within a rather participatory system that mixed public and private elements.

In terms of cluster research Farinelli (2007) has looked at the development of the Argentinean wine industry. She notes that the catch up dynamics that can be observed in the Argentinean wine industry diffused along with the introduction of the concept of boutique wineries and thanks to a core of local and foreign investors that introduced it to the country. However, this did not remain an isolated event and trickle down effects can be found in the industry (Farinelli 2007:186). While two cluster can be found in Mendoza and San Juan, the paths that they followed are rather different. The former managed too insert itself in an innovative and export-oriented dynamic, while producers in San Juan could not do the same (Farinelli 2007:187). In Mendoza emerged an organized cluster, with higher levels of cooperation among the actors and a higher level of innovation and knowledge diffusion along a broad set of dimensions, while San Juan remained an informal wine cluster. For example in the cluster of Mendoza this has meant innovation in the area of control over grape production. Winemakers there have progressively vertically integrated their business to acquire more control over grape production, in a move very similar to what the Napa Valley boutique producers also implemented (Farinelli 2007). Furthermore, horizontal linkages among producers and among producers and associational organizations exist in Mendoza that are not evident in San Juan. The Argentine Viticulture Union (UVA) the winemaking organization of the Bodegas de Argentina are both important example here. Farinelli (2007:192) notes how the Mendoza developed in a learning cluster that has an important characteristic: “it created inclusive system building dynamics which were crucial to avoid a twofold risk: that of a fierce Darwinian selection letting only export-oriented and elite wineries survive, and that of foreign investors crowding out local companies and discouraging any kind of technological spillovers.”

The Mendoza cluster, therefore, becomes an interesting example of innovation driven by small and medium enterprises and fostered by a specific institutional approach at the government level. However, the latter alone seems insufficient to explain the development of innovation systems in Mendoza and their failure in the San Juan region, leaving the door open for the importance of local entrepreneurs.
**Australia**

Like many other new world producers, Australia began producing wines with the arrival of European immigrants. The first serious efforts began in the 1800s in the Barossa Valley and until the 1970s the main production revolved around fortified wines and some less than desirable table wines. However, some companies still strived for quality and produced high quality products. The first seeds of the change that would blossom in the 1980s were planted in the 1960s when the Commonwealth Scientific and Industrial Research Organization (CSIRO), a government agency that helped support the development of the Australian industrial system, posted John Possingham, a plant biologist they had on staff, to a research project in Victoria on the development of dried raisins. As a by-product of his activity he started researching wine grapes that were cognate to the sultana grapes he was studying. He was particularly interested in mechanical innovation and new varietals (Collis 2002). In the mid-1960s as part of a tour of the US and Europe that CSIRO had approved, Possingham acquired the prototypes of two mechanical harvesters from UC Davis. These machines became the initial spur for a large scale program to mechanize the harvesting of grapes in the country. To understand the scope of the change it must be noted that the process required the redesign of vineyards (especially wine trellising) to take advantage of the machines and their physical extension to exploit economies of scale. The technological modernization of the modern Australian wine industry and a keener interest in higher quality, more desirable, grape varietals (for example, ensuring vine cuttings by attracting French viticultureists to Australia.). This started shifting the sector towards what in the 1980s would become a major entrance in world markets (Collis 2002; Smith and Marsh 2007). Technological advances have remained a key element of Australian wine research, branching into genetic engineering and genomics besides more classical areas like irrigation, pruning and so forth. Australia has become one of the leading wine producers in the new world and much of this success depended on specific characteristics of the industry and on the trajectory that it chose to develop during the past 25 years. In particular its institutional dynamic was critical (Smith and Marsh 2007) as was the focus on export markets (Aylward 2004; 2006). Of particular importance has been the strategy to develop a relatively different varietal, the Shiraz, as a classically ‘Australian’ contribution to the wine industry. This branding approach has been followed by various other export oriented countries in the new world producing
envelope like Chile, Argentina and South Africa that wished to distinguish their products from the European ones especially in the promising markets of the United States, Canada and Great Britain. Smith and Marsh (2007: 225) argue that there are three critical processes that explain the dynamics of the Australian wine industry. First, the industry generated a specific knowledge-creation infrastructure. It also experienced the emergence of a collaborative framework that allowed a certain group of actors to work as an engine for the development of the industry. Finally the consolidation and concentration of the industry changed the strategic control within the sector. According to OIV (2006) data only Chile with 61% of its production dedicated to export was more export-oriented than Australia (43%) among the countries in our sample. In 1990, Australia counted 535 wine producers, in 2006 there were a little over 2,000 (Australian Bureau of Statistics 2005). This is a very important growth for a sector that has also known increased concentration. In fact, mergers and acquisitions in the sector have now transformed what in the 1980s was a very fragmented industry in a highly concentrated one with a substantial degree of foreign control (Smith and Marsh 2007). It should also be noted that many of the more successful companies have a long history in the national wine industry, contrary to what happens in other industries that undergo broad innovative processes.

If the 1970s acted as the necessary technological and varietal development premise to growth of the sector, the 1980s still presented a set of complex issues of coordination to be dealt with. From the organizational point of view, Australia began with some organizations already in place. For example the Australian Wine Research Institute (AWRI) had been created in 1955 and the Australian Wine Bureau ten years later. However, the impact of these structures on the activity of the industry was not to become critical until the 1980s when the Australian wine industry lobbied for a strategy of infrastructure creation and public support while at the same time substantially streamlining its own associational structure (Smith and Marsh 2007). The first step was the creation in 1981 of the Australian Wine and Brandy Corporation (AWBC). The AWBC was to deal with international marketing of the Australian products along with regulatory and certification responsibilities. The AWBC was funded through user fees that were levied from wine producers and grape growers. The second step was to bridge the gap between small and large producers within the country. Because of a lack of representative institutions in 1984 the government fostered the creation of the Wine Industry Advisory Council and in the same year the Australian Winemakers Forum was also created to represent the interest of the
small and medium companies. Perhaps the most interesting part of the Australian experience has been the remarkable degree of cooperation that the various institutional actors have shown in focusing the sector towards its current format (Aylward 2006; Smith and Marsh 2007). This was not always the case and as recently as the 1980s, small companies had radically different perceptions of what the industry needed and of their interests than large ones did. To make things more complicated, the federal structure reproduced itself in a maze of weakly coordinated bodies, agencies and associations. The remarkable feat of consolidating basically all of these groups under one umbrella organization by 1992 is at the core of the success of the Australian industry.

The next step was to increase the organizational capacity of the wine industry and in 1991 the Grape and Wine Research and Development Corporation (GWRDC) was created. This organization has been a key element in ensuring that the Australian wine industry developed along a math of export-orientation and was very important in helping the growth of country’s most innovative wine sector: South Australia. The activity of the GWRDC was centered upon traditional research but an additional goal was to create a cooperative spirit and strong connections among firms. In the same year, an important liaison structure came into being. The Australian Council of Viticulture (ACV) connected firms, educators and the Departments of Agricultural of all states that are involved in the industry. In 1992, the AWBC retained its responsibilities in the area of information, certification and regulation but spun off the Australian Wine Export Council (AWEC) that was given the task of dealing full time with the exporting of Australian wine. The move was necessary in view of the success of Australian wine. Proof of this success was the signing the next year of a wine agreement with the EU.

The industry associations also fostered cooperative behaviour (Smith and Marsh 2007) at the firm level, an area in which they were particularly successful in South Australia (Aylward 2004) and provided a strategic framework for the whole sector. The most evident result of this approach was the Strategy 2025 report (Australian Wine Foundation 1996), which outlined the nature of the challenges and of the opportunities for the industry. The priorities that were highlighted in this strategy stressed industry cooperation and export orientation and were immediately picked up by the industry associations that served as a powerful transmission belt for these values: both the AWBC and the GWRDC had an enormous impact in making this the mantra of successful wine making in Australia. From an economic point of view the industry
has been undergoing a strong process of concentration for well over two decades (Smith and Marsh 2007). In practice the most gains from the cooperative arrangement of the sector accrue to larger companies (Smith and Marsh 2007), but some level of advantage has certainly trickled down the whole industry (Aylward 2004; 2006).

In terms of cluster analysis, the Australian industry has been analyzed by Aylward (2004; 2006) who used the differentiation between spontaneous and constructed clusters first noted by Mytelka and Farinelli (2000), to map the industry. His results (Aylward 2004) showed that the Australian industry was composed of spontaneous clusters. These are public sector agents, firms and suppliers that are clustered around a growth sector. In turn they can be separated according to innovativeness in informal, organized and innovative. The Australian wine industry is one of the most important example of innovative clusters in the country. In particular the South Australian cluster turned out to be a very important hub of production and exports, and to be a very clear example of the innovative cluster. The link between export activity and innovation here is also very developed (Aylward 2004: 428-429).
The less developed clusters of Victoria and New south Wales, instead fall into the ‘organized’ category and while here Aylward (2004: 430) found a similar activity to that of the innovative cluster, but the latter “is less intense, less integrated, involves fewer actors and is not as inclusive.” Furthermore, the influence of the industry bodies is not as strong in these clusters as it is in South Australia. The importance of strong coordination fostered by national policies and a robust institutional environment can hardly be denied in the Australian case (Aylward and Turpin 2003).

Figure 1. The South Australian ‘innovative’ wine cluster.
Finally, whereas the educational system in the innovative cluster revolves around the university system, in the Victoria and New South Wales ones it tends to be vocational. The most interesting findings that Aylward’s (2004) study put forward were the very close connection between the innovative nature of the South Australian cluster and its export orientation and the close connections that the firms there kept with industry organizations like the Cooperative Research Centre for Viticulture (CRCV) and the Australian Wine Research Institute (AWRI). While the geographical proximity of the industry associations to the South Australian cluster
can certainly explain some of this connection, membership in the innovative cluster seems to be an important explanatory variable. Its members appear generally to have a more cooperative attitude and tend to score better on competitiveness and innovation indicators.

More recently the industry has faced some important challenges. Australia, like many other wine producing countries has experienced an oversupply crisis, which led to significant extirpations. It also appears to have veered towards a more risk averse approach and have become too dependent on organizational patterns that limit its flexibility and efficiency (Aylward and Clements 2008). The growth of the industry and its global structure may begin to create a strain between the national organizational structure and the industry itself (Aylward 2007).

Canada

Canada has produced wine since the early 1800s, however for a long time this production was centered on native varietals like Riparia and Labrusca grapes that yielded an inferior product with respect to the European ones (Mytelka and Goertzen 2004). An early solution was found in producing sherry as a ready market existed for these in Great Britain (Hope-Ross 2006). Production focused on cheap wines with high alcohol content and prohibitionist attitudes tended to limit the scope of the Canadian industry. In the 1960s, winemakers in the Okanagan and Niagara Peninsula along with New World producers began shifting their approach. North American demand for more sophisticated wines emerged and the industry began restructuring. European companies began investing abroad, better technology was introduced and North American grape were extirpated to make room for European varietals. Public support and the development of research centres followed. However, Canada remained largely on the sidelines until the 1970s when in both Ontario and British Columbia a new crop of mostly small and medium sized companies began to develop boutique wineries. In 1974, Donald Ziraldo and Karl Kaiser in Ontario founded Inniskillin Wines; five years later, Harry McWatters opened in the Okanagan his Sumac Ridge Estate Winery. These were the seeds for the growth of the current Canadian wine industry (Hickton and Padmore 2005; Mytelka and Goertzen 2004).

The late 1970s and early 1980s were occupied with some important research and adaptation projects; such as the Okanagan Becker Project focusing on Vinifera grapes. Canadian wines
began gaining international awards (Hickton and Padmore 2005). However, it was in the late 1980s that the Canadian wine industry blossomed. The signing of NAFTA in 1988 and by the elimination of protection that the industry enjoyed after a GATT decision had a major effect in stimulating the production of high quality wines (Hickton and Padmore 2005; Kingsbury and Hayter 2006). At the same time, large scale publicly supported programs for the replacement of native grapes with the now demonstrably successful Vinifera were started and standards for wine quality were introduced. Ontario in 1988 created the Vintners Quality Alliance (VQA) a variation of which was adopted in British Columbia in 1990 (see Rabkin and Beatty 2007). In 1996, the Canadian Wine Institute (CWI) developed the first national quality standard. Sales of these wines increased dramatically in the 1990s and two major wine research centres opened at Brock University (Cool Climate Oenology and Viticulture Institute) and at the University of British Columbia (Wine Research Centre). Canada remains a minor player in terms of exports: in 2004/2005 only 3.3% of total sales (which were worth $1.3 billion) were exported and then mostly went to the US and Taiwan (Hope-Ross 2006: 6-7). While Canadians consume more wine, only about one third of Canadian consumption is made up of domestic product. This is both a challenge and an opportunity for the sector as it is presented with a large market that it may be able to establish itself in. At the same time, the record shows that imported wine increased its sales at a much higher rate that Canadian brands between 2000/2001 and 2004/2005 (23% as opposed to 13%) and that imports enjoyed a higher price point that domestic ones (Hope-Ross 2006: 10).

Historically, governments have been important players in the development of the Canadian wine industry. In 1927 Ontario created the LCBO after the end of prohibitionism (Mytelka and Goertzen 2004), which along with the Ontario Grape Growers Marketing Board (now simply the Grape Growers of Ontario - GGO) created a layer of mediation between clients and suppliers. The OGG in practice establishes bottom prices for the grape varieties marketed to the various end users, while the LCBO effectively has a monopoly on wine sales in the Province and can control market access especially for smaller producers. Initially the LCBO operated very much to restrict the sales of alcohol and the production of wine, reflecting a rather puritan vision of the ill effects of spirits. As a result, the Ontario wine industry shrank dramatically between the late 1920s and the mid-1970s (Mytelka and Goertzen 2004: 47). The LCBO had further limited sales (and protected local wines) by imposing a crippling 60% mark-up on
imported wines while limiting the mark-up on domestic wines to 1%. It was only with a 1987 GATT decision that found against the liquor board and with the Canada-USA FTA in 1988 that these barriers came down. According to Mytelka and Goertzen (2004) the effect of this retail ‘bottleneck’ has left the growing number of smaller wineries that have emerged in Ontario since the 1970s with a suboptimal situation. The complex and time consuming process of getting their products into the provincial stores, the tight guidelines regarding sales performance to have their products kept in stock, and the apparent dominance of large wineries in the retail space, all amount to increased difficulties for boutique producers. Furthermore, the LCBO’s approach is directed at the marketing of wine per se, using a variety of innovative approaches, but without giving any specific help to local wines. For example, in 2002 the LCBO had a campaign promoting Australian products (Mytelka and Goertzen 2004: 65).

In British Columbia the Liquor Distribution Board controls the greatest majority of sales of alcoholic products. Like in Ontario wineries are permitted direct sales through their own stores and to restaurants and hotels; however, the majority of wine sales is affected though the BCLDB. The latter, unlike its Ontario counterpart, has aggressively promoted the sale of BC wines (Hickman and Padmore 2005). Beside the BCLDB, in British Columbia exists the Liquor Control and Licensing Branch (LCLB) which, among other things, has the task of granting licenses for the operation of wineries and breweries.

Wolfe, Davis and Lucas (2005) have noted that agricultural sectors often develop hybrid type clusters. This is generally linked to the agricultural and primary sectors in Canada and we begin with the assumption that the two wine clusters in Ontario and British Columbia will fit this particular structure. In our case the wine clusters of British Columbia and Ontario appear to fit somewhere between the informal and the organized cluster. In particular the scarce attention dedicated to export markets and the fragmented nature of the industry recall the former.

From the organizational point of view the Canadian industry is relatively weak compared to some of the more successful new world producers. In 1999 the Canadian Wine Institute, which had been in place for almost six decades, became the Canadian Vintners Association (CVA). This move attempted to bring a more unitary approach to industry as the CVA now absorbed the role and responsibility of VQA Canada, with the British Columbia Wine Institute and the Wine Council of Ontario becoming partners in this association. These two provincial organizations were later joined by the Winery Association of Nova Scotia. In practice, however, this structure
represents the largest producers in the country and collects members almost exclusively from BC and Ontario. In 2010, the over 50 members of CVA represented 90% of Canadian wine production. The CVA has a variety of coordination and marketing roles both at the domestic and international level and generally advocates for the industry.

The Canadian wine industry is composed of two clusters (Niagara and the Okanagan) each with their own links to industry associations, growers, governments, retailers and researchers. However, each of these clusters is distinct although linked and they are both well established. Analyses exist for the Canadian wine clusters, which center on the Okanagan region in British Columbia and the Niagara peninsula in Ontario. Mytelka and Goertzen (2004) provided a seminal study of the latter, which was matched by the work of Hickton and Padmore (2005) on the Okanagan industry. Both works portray the wine sectors in the regions as clusters with peculiarities due to their history and location.

*The British Columbia Cluster*

The modern wine industry in British Columbia emerged in the 1970s on the crest of changing tastes and attitudes regarding wine consumption in North America. In the Okanagan, which was to become the core of winemaking in the province, a small group of entrepreneurs began producing wine in estate vineyards from vinifera grapes. These pioneers were joined in the 1990s by the rest of the companies of the region as the protection of the wine industry collapsed because of NAFTA. As quality increased and became more consistent by the mid-1990s the region had developed into an important centre for winemaking.

Hickton and Padmore (2005) note that the structure of the industry in the Okanagan is relatively complex but the cluster is dominated by two important institutions: the British Columbia Wine Institute (BCWI) and the Pacific Agri-Food Research Centre (PARC). The former is an industry organization that deals with VQA requirements and advocacy for the industry beside fostering sector research and developing marketing strategies. PARC is part of the regional research structure that is linked to the federal ministry of agriculture (Agriculture and Agri-Food Canada). Through its Summerland institute PARC fosters research in most areas linked to winemaking and viticulture. Other important players in the cluster are the University of British Columbia Wine Research Centre that deals with biosciences research in winemaking and
viticulture. While UBC now has a satellite campus in Kelowna, the original comment made by Hickton and Padmore (2005) that the Wine Research Centre remains rather distant from the core producing areas still stands. The Okanagan industry remains a mix of small, medium and large wineries where along giants like Vincor Canada and Andrew Peller we find small local producers. Structurally it appeared to be well vertically integrated with a lower degree of reliance on external supplies of grapes than in Ontario (Hickton and Padmore 2005: 113). Investment and innovation have been important to the development of the area (Hickton and Padmore 2005) and innovation links appeared in the Hickton and Padmore (2005: 99) work to link together various geographical sub-cluster realities. Peer linkages connected along community linkages and were supplemented by long-range links that linked Okanagan units with their parent companies in Ontario. As concentration also appears to have increased in the Okanagan since this study the importance of these trans-provincial links may have increased. Hickton and Padmore (2005: 99) individuated three sub-clusters. The Kelowna vineyards and Mt. Boucherie formed a ‘top sub-cluster’ that included the most important and historically most salient players. The ‘middle sub-cluster’ hinged around the Summerland, Peachland and Naramata Bench areas. In this sub-cluster were found both established and upcoming winemakers. Finally, a ‘bottom sub-cluster’ existed in the Golden Mile/Black Sage Road areas. Here the network structure appeared less formal than in the previous two sub-clusters. Hickton and Padmore (2005) then went on to measure the strength of the networks and found that network analysis supported robustly the middle cluster but that the bottom and top cluster did not fare so well. The reason for the lack of actor interaction in the top cluster may have been the size of many of the companies represented in that sample (mostly large and medium). Qualitative research did support the existence of the bottom cluster (much more informal) better than actor-network analysis, reflecting perhaps a less formal, more ‘movement-like’ approach. Still, as a whole the Okanagan cluster resulted to be “well networked” (Hickton and Padmore 2005: 102) and innovation appeared well correlated with connectedness with companies willing to share their knowledge.

The Ontario Cluster
The emergence of a cluster in the Ontario wine region was spurred on by government help in the late 1980s, especially through the Ontario Wine Assistance Program, which like many other programs in new world producers led many firms to replace relatively unattractive varietals with more marketable products. Once again the changes were determined by modified consumption patterns in the wine markets (Mytelka and Goertzen 2004). The result was the creation of an industry that in 2009 had around 250 producers, many of them belonging to the Ontario Vintner’s Quality Alliance (VQA). The VQA system was obtained by the new, more dynamic wine producers that had begun to emerge in 1970s as a way to distinguish their higher quality product from the rest of the wine sold in the province. The requirement that VQA wines contained only Ontario produced vinifera grapes (and therefore could claim higher prices than generic wines) was at the core of the 1989 VQA project. For ten years the system was based on a voluntary approach until in 1999 the provincial government enshrined these rules in the VQA Act. Two years later VQA Ontario was created to enforce the norm.

The emergence of the this organization has relatively deep roots. In 1993, a strategic plan was created in Ontario for the development of the wine industry. The plan was the product of a concerted effort by stakeholders in the industry, in government and in the LCBO. Its goal was to develop the industry and to create positive economic effects. Along with recognizing the need for government support, the importance of improving quality and competitiveness, and to establish a successful branding, the sector would rely on industry-based quality standards. There is no doubt that the strategy of introducing VQA wines has worked as both production and consumption of these products have grown very quickly in Canada (WCO 2010).

The progressive increase in the capacity of the industry to generate rules that protected and increased the value of its products shows both the increased awareness of changing tastes and a strategy of adding value to local products. VQA Ontario deals with appellations of origin for the province’s wines and four viticulture areas are recognized in Ontario. VQA Ontario administers the VQA Act of 1999 but also serves an educational role and a liaison and advocacy role on behalf of the vintners with government and stakeholders. This organization has on its board a mix of small and large companies. Nine directors are elected by the winery members: three each by small, medium and large producers. Also represented are the provincial government, the GGO, and the Ontario Restaurant, Hotel and Motel Association; each with one

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2 These are the Niagara Peninsula, Lake Erie North Shore, Pelee Island and Prince Edward County.
person. The focus on quality wines continued with the *Poised for Greatness* strategy that, developed between 2001 and 2002 with the input of the Ontario Ministry of Agriculture and Food, the WCO and other stakeholders relied on developing further the recognition of the province’s wine through their VQA strategy both at the domestic and international levels. Furthermore, it aimed at linking the success of wine to ancillary industries like tourism.

The Ontario industry has a few important producers that are connected to global markets and a large majority of small or medium firms that are firmly oriented towards the local markets. The industry is coordinated by the Wine Council of Ontario, which in 2010 had 82 members, which represented over 99% of wine sales and production in the province (WCO 2010). The council acts as a liaison between the wineries, growers and government agencies that are involved in the sector. Its role also involves the process of marketing the provincial products and establishing policy for the sector. The WCO does represent a variety of firms, including small and boutique wineries, but the weight of the very large companies that dominate wine production in the province within the organization is undeniable.

In Ontario organizational relations are an important way in which the industry developed and in particular the Grape Growers of Ontario (GGO) and of the Liquor Control Board of Ontario (LCBO). The latter, as noted above, has had and continues to have an important effect on the capacity of wine companies because it effectively controls access to markets and can effectively limit the possibilities for smaller companies. The larger multinationals like Vincor are much less vulnerable to the activity of the LCBO and seem to be better connected to the national and provincial organizational structure. The most obvious effect of this organizational structure, though, is to reduce the incentive for smaller wineries to become innovative (Mytelka and Goertzen 2004).

The GGO has been an important player in the Ontario wine cluster. In place since 1947 as the Ontario Grape Growers’ Marketing Board (it was renamed Grape Growers of Ontario in 2003), this marketing board effectively shielded the growers from a monopsonic situation that had developed due to a strong concentration among wineries in the province. However, with the shift in wine making especially during the 1980s, the system changed profoundly. As more boutique wineries emerged the vintners began engaging, much like what had happened in the 1970s in Napa, in grape growing. Because some grape growers also began making wine the efficacy of and need for a grape marketing board was increasingly questioned. In the 1990s, the
smaller growers/vintners became increasingly reluctant to pay the marketing fee through which the GGO finances itself. In 2001, they were granted increased representation on the board of the GGO but Mytelka and Goertzen (2004: 18) wonder whether this solution really does much for a group of firms that are constrained in their dynamics by the organization.

The two wine clusters show some degree of innovativeness in previous studies (Hickmore and Padman 2005; Mytelka and Goertzen 2004) even if they did not stand up to the level of truly innovative clusters. For example, the Okanagan one lacked a close connection to a critical research centre of the type provided by UC Davis in California. The diffusion of innovation and the networking model seemed almost to reflect a social network structure. Neither cluster paid much attention to bolstering its exports through the use of innovative technology in the way in which the Australian sector had (Aylward 2004; 2006). Hickman and Padmore (2005: 89) present five categories of innovation with which they look at the BC wine cluster: growing and viticulture (propagation, growing, cultivation and harvesting of grapes), making (crushing, fermentation, finishing and packaging), marketing/product design, marketing/selling, and business processes. They identify the Okanagan Valley cluster, occupying the central and southern part of the valley from Winfield to Osoyoos, as the most integrated of the BC wine clusters and that (Hickman and Padmore 2005: 91).

**Chile**

Chile unlike Argentina has a relatively limited area that can be planted to vineyards along the central coast near Santiago. While the history of winemaking here is a long one and the country even enjoyed a brief moment of notoriety in the 1890s when it became a critical supplier of vine cuttings for Europe during a phylloxera crisis there, it was not until the 1990s that its wine industry became a relevant part of the world market. The industry had already began to show promising signs of development in the 1980s when Miguel Torres had begun to acquire modern technology in a bid to innovate winemaking in the region (Gwynne 2008). In the 1990s this period the introduction of democracy, a better economic outlook for the country favoured the entrance of new players from abroad and the growth of the sector (Gwynne 2006; 2008). At the same time viticulture processes began to innovate. Under the watchful eye of foreign investors the country began producing wine for export and underwent a strong reshaping process, which involved both technological changes in the winemaking area (such as new vats for vinification).
and the planting of better marketable varietals. However, the process was one of innovation absorption more than of full-out foreign control of the Chilean wine industry of the type seen in countries like Australia (Gwynne 2008). At the same time the Andean country has begun to push the Carmenere wine as the classically ‘Chilean’ wine in keeping with the relatively common strategy that export-oriented new world producers have been following in a bid to differentiate their products from the more traditional European ones. As the quality of the wine increased the country began exporting in earnest and this has also had interesting effects on other process. For example, Chile has begun to delimit controlled viticulture areas, which have steadily been replacing the less profitable approach of sourcing grapes from around the country to produce blended products. The 1995 Wine Law was instrumental in the creation of 13 regions that are subject to the Denominación de Origen of their wines and that is compatible with the EU regulatory system.

The Chilean wine industry has been widely studied in terms of clusters and innovation (Bell and Giuliani 2007; Giuliani and Bell 2005; Visser 2004; Visser and de Langen 2006; Gwynne 2008; Cusmano, Morrison and Rabellotti 2009). The picture is one of expanding production and great attention to the export sector. Gwynne (2008) looked at the Casablanca and Colchagua regions. His focus was on the development of three types of knowledge and their importance in the development of the wine industry in these valleys. These are the viticulture knowledge, and knowledge from both local and global networks (Gwynne 2008:5). He found that innovation in the technological and viticulture areas have been critical to the development of the industry. However, also very important have been the approach to export and to the marketing of these exports. While the formal knowledge of many workers in the industry was not very high in the Colchagua Valley the general practical knowledge acquired by those workers and the links that developed among a substantial number of companies helped to embed the companies themselves in the knowledge cluster (Gwynne 2008: 36-37). Gwynne (2008:37) using the work of Olavarria et al (2008) identifies three different types of networks in the two valleys that he studies:
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.”

The network type that has the most linkages is the first one (Giuliani 2007; Gwynne 2008). However, this type of network does not seem to be diffusing knowledge, which is the job of the second type of network. The latter shows a lower density in its linkages (0.12 versus the 0.34 of the first one). In this case the larger firms were more involved in the knowledge diffusion process. The third type of network seems to have lower density (0.036) and therefore firm interaction to be less important even as connections with universities and associations is present. Gwynne (2008:42) notes how innovation has been critical to the sector but also that as companies that were successful began showing less integration with other local realities. The importance of a group of centrally placed and active companies cannot be underestimated. Giuliani (2007:157) noted how “[k]nowledge is diffused primarily within the boundaries of one or more cohesive subgroups of firms, such as … the ‘core’ in the Valle de Colchagua.” These knowledge networks remain very different from the knowledge networks and were created for different reasons (Giuliani and Bell 2005; Giuliani 2007; Bell and Giuliani 2007). In terms of innovation the study conducted by Visser (2004) and based on a sample of Chilean wine industry experts found that the latter gave a low score to the innovation and infrastructure governance regimes of the Chilean wine clusters, whereas the marketing and promotion, education, and internationalization ones were considered to be better at fostering collective action. This may be a further confirmation of the nature of knowledge networks pointed out by other authors.

France

France is probably the most iconic wine producer in the world along with Italy. Viticulture developed here from Greek colonies in the Southern shores of the country and continued throughout the centuries. After the phylloxera epidemic of the late 1800s the industry sought ways to improve the quality of its products and to develop a better understanding of the process
of winemaking and viticulture. By enlisting the help of scientists and experts (among whom Louis Pasteur) French winemakers made great strides in the field. The industry began a slow process of recovery and in 1935 the government passed a variety of laws to protect the quality of wine. Chiefly among them the Appellation d'Origine Contrôlée (AOC) system, which became the standard for all subsequent origin appellation. The system required that the wine be produced from grapes collected in a specific region and in a traditional and consistent manner. France has developed a large number of wine regions and their production accounts for about half of all French wine. The appellation system is overviewed by the Institut National des Appellations d’Origine (INAO). Along with the AOC other quality system exist in the country. French wine is divided in table wine and quality wine. The former is further divided in Vin de Table (French wine) and Vin de Pays (wine from a specific region). The latter also has two categories: the Vin Délimité de Qualité Superieure (VDQS), which is reserved for wines that are trying to get into the AOC system and finally the AOC itself. The industry is rather fragmented in terms of economic concentration with a large amount of small and very small companies still existing. Furthermore a large amount of wine comes through the cooperative system that is aimed at maximizing the profit of the grape sellers who are the members of the cooperatives (Remaud and Couderc 2006). Both cooperatives and wine brokers are very important parts of the sector. The cooperatives bring together the often very fragmented companies and act as intermediaries in the transaction of wines, but also in the vinification and sale of wines (Zanni 2004). Wine brokers tend to be very important in the bulk wine market and are more often used by sellers that are not part of the cooperative system and buyers who are outside of the production sphere of the industry (Baritaux et al 2006).

In France the amount of vineyards decreased by 14,000 hectares since 2007 as EU extirpation grants were increasingly accepted by farmers (Perini 2010: 3). The country also saw a substantial increase in the size of its organic wine market, which grew to about 29,000 hectares (59% more than in 2007) in 2010. The French industry is one of the most complete in the world in terms of varietals not least because of the great variety of climate areas that exist there. Some of the most recognizable of these wine regions, which are regulated by the INAO, are the north-eastern region of Alsace, the Atlantic costal region of Bordeaux, the Eastern area of Burgundy and of course the small but very famous area of Champagne. The region of Burgundy has been analyzed by Ditter (2005) in terms of cluster structure. While the region does not qualify as
cluster in the sense that the California (Porter 1998), Mendoza (Farinelli 2007) or the South Australia (Aylward 2004) regions would still retain a “clear local dimension [and] … has long contributed to the industry’s success by combining quality and variety to the supply” even as it experiences growing competition from New world producers (Ditter 2005:47-48). The region of Burgundy is divided in five wine producing regions and has a very developed AOC system in place with over 100 appellations (Ditter 2005). This is a region that is very highly export oriented producing only 0.6% of world wine and exporting 50% of its production for a value of 5% of world production. The region has various institutional structures in place including the Burgundy Wine School and the Burgundy Wine Board (BIVB), which brings together the trading side of the business (Fédération des Négociants-Eleveurs de Bourgogne) and the growers (Confédération des Associations Viticoles de Bourgogne). The BIVB has set itself the goals of helping with the promotion of the local wine and of improving the quality of its wines. The most important actors in the cluster are the wine producers and the wine trades even as convergence between the two groups is becoming more noticeable (Ditter 2005:48). The cluster suffers from an extreme level of fragmentation that is reflected in the presence of over 5,000 vineyards in the region.
The Burgundy Wine Cluster

The wine industry has however been able to spur the growth of other related industries much like in other wine cluster (Ditter 2005:49). The most important difference in the Burgundy case is to be found in the fact that the cluster is highly embedded in the terroir structure that Ditter (2005:49) identifies as a type of regulatory barrier that protects local producers. High reliance on a terroir also has some potentially very negative consequences like the lack of financial critical masses that is engendered by the fragmentation of the producers in small and very small enterprises and a lack of a cooperative tradition (Ditter 2005:49). The Burgundy approach is different from the one found in New World producers, which have approached wine-making as a modern business approach. Even when they have pressed for the recognition of DOC-type appellations, this has been part of a branding process and a marketing strategy that would help them access new markets. According to Ditter (2005:50), in Burgundy “wine production, though highly lucrative, is not taken in its economic dimension but rather centred round the “cultural” nature of the product.” Furthermore, the innovative dimension of the French case is not as developed as the new world producers’. The ‘cultural’ approach to the terroir and the strict rules that define the AOC can limit the capacity of French producers to modify their product through innovation to match changing tastes and demand in the global market, something that is the core of successful new world clusters (Ditter 2005:50). Finally, the relation between grape growers and winemakers/wine traders in the organizational structure of the Burgundian wine region can lead to opportunistic behaviour in the system. This can be particularly dangerous in the granting of AOC appellation. Once these are granted the winemakers may be tempted to relax their standards thereby generating a wide difference of wine qualities within the same appellation and hence damaging the cluster. Ditter (2005:50) argues that changes in the structure of certification bodies to make them more independent should be considered to solve this issue. However, he is keenly aware of the internal contradictions that a terroir system would face in trying to implement this type of change.

Remaud and Couderc (2006) conducted a series of interviews of mostly small wineries in Australia, New Zealand and the French region of Languedoc-Roussillon. From the analysis three types of clusters were found. In the first the managers aimed at improving their business’ economic performance and were oriented towards increasing exports (35.6%), improving the reputation of their wines (27.4%) and developing the domestic market (21.9%). The second
cluster aimed mostly at increasing their market share and aimed at doing so by developing the domestic market (44%) and developing export markets (32.7%). Both of these clusters perceived the strength of their companies to reside mostly in the quality of their wines. These clusters also included a mix of French and New World companies in a ratio of 4:6. “Cluster 1 has significant innovation activities, bottled wine production, and an export orientation. The main strategic goal of these small firms is to improve their economic business performance. Cluster 2 is more heterogeneous. The strategic goal of these wine firms is to increase their market share” (Remaud and Couderc 2006:414).

The third cluster was composed almost in its entirety of French companies, focused mostly on bulk wine and showed a remarkable absence of innovation. The firms in the sample are very small and aim at improving their economic performance mostly through expansion in the domestic market. The wine that is sold is mostly related to the bulk market (Remaud and Couderc 2006:414).

Another example of French wine cluster is the one introduced by Zanni in the description of the Bordeaux region (2004). Much like in the case of the Burgundy region the three most important groups here are the grapegrowers/winemakers, the wine merchants who sell about 75% of the region’s product and are especially important in the export sector, and the *syndicats* that control the AOC appellations. Other important organizations are the public institutions like the National Institute for AOC that controls the quality of wine production in France, the Institut Technique de la Vigne et du Vin (ITV) and the Institut National de la Recherche Agronomique (INRA), both involved in the research area. Also important are the associational structures that have been created by the industry. In particular the Conseil Interprofessionnel de Vins de Bordeaux (CIVB), which has important roles in fostering the image of the Bordeaux region, in coordinating the activity of its members, is involved in research activities and monitors the economic situation in the area’s wine sector (Zanni 2004).

The CIVB is of interest in the case of Bordeaux because it tries to bring together the three major players in wine production and sales from the region. Created in 1948 to bring together the representatives of the viticulture, sales and brokering professions that still dominate the area of wine sales in France it has since developed to become a tool for the diffusion of knowledge for the collective benefit of the wine region. This organization finances itself through fees paid by winemakers and wine merchants of the region (Zanni 2004:232). Zanni
(2004:233) notes that coordinating collective and company level marketing can be tricky as the association’s “main goal is to enforce and better the whole Bordeaux’s image, while the firm’s strategy is to promote their brand or châteaux names so as to sell as much wine as possible. This is the limit of the collective action.”

As in many other parts of France the importance of the cooperatives cannot be underestimated. These structures in Bordeaux sell to both wine brokers and on the open market. The industry has been under pressure from two different areas: a structural direction and because of short term fluctuations. Structurally the competition of new world producers has been exacerbated by the relatively small size of the average French company and by a labelling system that should be overhauled. In the short term, economic changes like a strong Euro and trends of overproduction have been creating issues for the companies (Zanni 2004). There is no doubt that some changes must be brought to the French wine industry to help it focus its response to new world competition but there are some local and general structural and cultural realities that seem to limit the potential scope of these changes.
Germany

While German wine production goes back to the times of Roman occupation and the country can claim some excellent products, there also is a lot of mediocre wine being produced there, especially of a very sweet and rather undistinguished nature. The wine production areas of Germany tend to be clustered around the French border in the South West of the country and are eminently suited for white wines like Müller-Thurgau and Riesling. German wines had to battle
both an objective low quality in the bulk market and a shift in the tastes of consumers away from sweet varietals and towards fuller bodied, drier wines.

In 1971, the German government introduced a detailed set of legislative tools that created an official quality classification scheme which was designed to measure sugar content: the higher the sugar in the wine, the higher the quality classification. This made sense in terms of the geographical nature of the German wine industry: because of its cool-climate wine growing regions, the best wine would be planted on South slopes where it would get the most sun and therefore the sugar content would be highest. However, what happened was that farmers began replacing the temperamental Riesling grapes with other varietals that yielded poorer quality wines but higher sugar contents therefore being able to claim a higher official classification while yield modest wines. An example of these practices is the infamous *Liebfraumilch*. While this system is still in place, beginning at the end of the 1980s some wine estates that were concerned about the repercussion that the practice was having on the perception of German wines, began developing their own quality charters.

One cluster that has received some attention in Germany is the one centered around the Baden region (Zanni 2004). This is a relatively large wine area, measuring over 15,000 ha, the third for importance after the Rheinhessen and Pfalz ones (Deutschen Weininstituts 2010:6) and being divided in nine subclusters (Zanni 2004:243). Like Wurttemberg, Baden shows a high number of cooperatives involved in the production of wine. About 100 such structures are involved in marketing around 85% of the product of Baden. Emerging since the early 1880s, these cooperatives obviated the fragmentation of the agricultural land and bring together thousands of producers (Zanni 2004). The region of Baden is not an important exporter of wines, much like the rest of the country (Deutschen Weininstituts 2010; Zanni 2004). Producers in the cluster are attempting to modify their production and marketing to meet domestic demand and (to a more limited degree) world demand (Zanni 2004). One example is the small cooperative of Königshaffhausen that is already using the new quality classifications to brand their products in a way that reflects more closely the tastes and request of the modern wine market. In the interviews conducted by Zanni (2004) one of the problems that the cooperative highlighted was how difficult it was for them to be taken seriously as an economic reality in a market dominated by very large, corporate producers. Focusing among the rest on high quality Pinot, the cooperative has obtained some interesting results.
**New Zealand**

Today New Zealand has been an important example of the wine export approach. While the size of its exports is limited, New Zealand products command the highest average prices in the export market. This was not always the case. Like many other wine producers in the new world, the roots of the industry in New Zealand go back to the 19th century but the quality and quantity of the product were not very high. Production remained locked in this model for many years. In the 1960s, the wine industry was producing very different wines that were very poorly marketable. It was with the introduction of vineyards in the Marlborough region, which now accounts for over half of the country’s producing hectares (NZW 2008), by Montana in 1973 that a new track was laid for the sector creating the prospect of an export strategy. The lack of coordination in the industry was perceived as a problem and, in 1976, the Wine Institute of New Zealand (WINZ) was created to obviate to this situation. It was financed by a compulsory levy required under the *Wine Makers Levy Act*. The New Zealand government had passed in the same year the *Winemakers’ Act*, which mandated for all actors licensed to produce wine membership in the Institute. WINZ has played an important coordinating role in the industry by connecting the various actors, surveying their activity and therefore acting as a hub for information gathering and sharing. In 1980, WINZ created an export sub-committee that would develop this strategy. The following year, the government passed the *Winemakers Act and Regulations*, which instituted the first framework for export certification. The country also listed its grape varietals and its producing regions to get in line with the requirements of the European Economic Community. The government policy in the 1980s was to help the producers to reshape their business by eradicating excess capacity and it opened the market to international competition as part of its neoliberal approach. The immediate effect was to allow for a strong flow of bulk Australian wine. Because the quality of the latter was superior to that of comparable New Zealand products this section of the market was quickly shut to domestic producers and the industry oriented itself towards export of higher quality wines. The United Kingdom and Australia were two of the most looked at possibilities for the industry. In 1984 only 97 winemakers were active in the country but the process of building an export strategy continued with the 1985 Focus New Zealand project, which looked at the Australian market and
with the release of the iconic Cloudy Bay vintages that became such an important symbol of the quality of New Zealand products. Winemakers had begun to introduce varietals that were more apt to be successfully exported like Sauvignon Blanc and Chardonnay and the number of operators grew steadily to reach 204 in 1995, and 585 in 2008 (NZW 2005; 2008). At the same time, the industry focused on improving the quality of its wines and the average price of the exported product rose from about US $4 per litre in 1999 to US $6.25 in 2003 and to US $6.75 in 2008. Much of the export strategy of the 1980s was based on establishing a unique branding for the wines that the terroirs and climate of New Zealand were producing and the focus remained on the Australian and UK markets. By 1990, the industry was attracting increasing attention from other EU countries and North America. With the blessing of the government in 1991 was launched the New Zealand Wine Guild (NZWG), which dealt with the implementation of a coherent export strategy. As the export quantities and quality increased in the early 1990s, the country began formal negotiations with the European Union in 1993 to sign a wine agreement in order to solidify an export strategy that was still going through some growing pains. The Wine Makers Regulations were also passed in 1990. Made under the Winemakers Act, they dealt with the licensing of wine makers and introduced the requirement of a ‘certificate of compliance’ to the Food Regulations (1984) that would be required to export wine.

Organizationally, 1994 was an important year because the New Zealand Wine Guild and the Wine Institute of New Zealand begin cooperating even more closely, with NZWG moving into the same building occupied by the Wine Institute and taking over the export marketing functions for the sector. In the same year, WINZ began administering the Wine Export Certification Service on a contract with the country’s Ministry of Health. By the mid-1990s the focus of the export strategy had expanded to include, beside the traditional Australian and British markets, the United States, Canada, and Germany even as the negotiation with the EU broke down in 1996. In 1998 the Wine Institute incorporated the New Zealand Wine Exporters organization, increasing its activity in the area as exports and average wine prices continued to grow. In 2000 the NZWI released a new strategic plan but there were also some important changes in the regulatory and legislative field as the Australia New Zealand Food Authority produced a new standard for wine and the New Zealand government set to work on new wine legislation. In 2002, the Wine Institute of New Zealand and the New Zealand Grape Growers
Council joined to form New Zealand Winegrowers (NZW), which now controlled the activities of these two organizations, including the exporting ones (New Zealand Trade and Enterprise 2004). NZW is now working on a Sustainable Winegrowing New Zealand strategy that is an industry standard to foster economic, environmental and social sustainability in the sector and developed marketing offices in the USA and the UK. This is being supplemented by the ‘Family of Twelve’ group that brings together the top 12 brands in the country (New Zealand Trade and Enterprise 2007).

It should be noted that the process of institutional concentration in the New Zealand wine industry was very important in the development of recognizable brand for the export market, and the collection and diffusion of critical information regarding the industry. For example, NZW administers a yearly survey (which has a very good response rate) that allows the industry to pinpoint the state of the industry with good accuracy. The industry has also undergone a process of increased foreign penetration and of vertical integration with a continued importance of small and medium sized companies (New Zealand Trade and Enterprise 2007).

The structure of the New Zealand wine industry was mapped by Investment New Zealand (2007:19) and it shows a similar structure to the one that Porttter (1998) had discovered in the California cluster.
In terms of clusters Dana and Winstone (2008) looked at the Waipara wine cluster. Located in the South of the country this area did not develop as a cluster on the traditionally recognized driver of export orientation. Instead Dana and Winstone (2008:2182-2183) note that four other reasons determined its growth. The intention to develop the regional identity of the area was an important driver here. So were the desire of growers to come together and learn from one another and to fund both research and marketing activities also played a part. Finally, the need to develop a community spirit in the area was also a premise of the clustering. The existence of a network associated to the wine industry was also recently confirmed and the firms studied there operated in a strategic and intentional manner focusing resource-based input requirements, on the strategies of activity-based capability, and the values of the actors (in order of importance). These affected the strategy of the firm, its relationships and the industry’s environment (Benson-Rea 2005). While Perry (2004:93) noted that some of the attempts at generating cluster structures in New Zealand tended towards the “establishment of groups with membership restricted to large organizations or those concentrated in the one part of the value
chain” this issue does not seem to apply to the wine cluster even with the creation of the Family of Twelve (New Zealand Trade and Enterprise 2007).

Spain

Spain is the country with the highest area planted with vineyards in the world with 1.1 million hectares but the relatively low yield of the land places the country at the third place in terms of wine production (Perini 2010). Of particular importance in Spanish winemaking are the regions of Rioja and Ribera del Duero. The industry has its roots to before the Roman conquest of Iberia and in 1926 in Rioja was developed the first Spanish appellation regime. This region has established itself as a key winemaking area. While Rioja has an extremely long history in the sector. Food shortages during the 1930s and 1940s led to the progressive substitution of vines with foodstuff and in terms of modern winemaking it was not until the 1950s that it returned to a moderate growth albeit mostly in bulk products. A core industry emerged only in the 1960s. In the 1970s, mirroring the developments in some new world producers, wine in the Rioja received impressive reviews and with that came interest from foreign investors and the development of a boutique industry.

With the end of the dictatorship in 1975 and the entry in the EU in 1986 the industry started to change and the influence of the evolution of the global wine market began to have its effect on the structure of the sector. Like in many other countries, winemakers introduced more readily marketable varietals and set themselves to produce higher quality boutique wines. The success of the early vintages from the region though did not carry through to the 1980s when the region of Ribera del Duero began producing more competitive vintages. In response to the challenge, Rioja winemakers shifted their production towards the same vintages and process that were in place in the new world. Rioja became a key player in shaping the industry towards a more high quality approach and one crucial part of the project was the institution of European-style classification systems. In this field the original Denominación de Origen that the winemakers of Rioja had developed in 1926 was extended to the whole country 1932. This model, which was most recently reviewed in 1970, is a close kin to the French and Italian classification systems and has created about 80 wine regions around the country. A second classification model, the Denominación de Origen Calificada (DOC) is more restrictive and is applied only in Rioja, Ribera del Duero, and Priorat. The DOC model also counts on a Regulatory Council that sets
and enforces the rules for wines that are granted the DOC status. The Regulatory Councils are able to created very detailed rules for both viticulture and wine production. Only the wines that are deemed to not only respect these rules but also pass a tasting test are granted the appellation. The Spanish wine industry deals with specific climate issue as a relatively low rainfall and relatively low yields from vineyards. Among other things, the innovation in the modern Spanish wine industry focused on drip irrigation and was often developed with the help of foreign experts. Along with these technologies also came mechanical harvesting. In the 1990s, innovation also came to winemaking, especially in the ageing process from winemakers that hailed from New World producers and the quality of wine has generally improved very sharply. The region of Rioja has been analyzed in terms of clusters for the Spanish wine industry (Larreina and Aguado 2008). The study covers 108 wine company in the region selling 90 percent of the region’s production and around 50 suppliers. According to the results about 77% of all of the expenses incurred by wineries in Rioja went to local firms (Larreina and Aguado 2008: 160). In terms of economic importance the Rioja cluster is the largest economic activity in the region employing 14,000 people directly (and another 20,000 earning an indirect income) and has known a true explosion since the early 1990s (Larreina and Aguado 2008: 161-162). The cluster matches the ‘industrial district’ structure with a large number of small and medium enterprises, close links in the regional culture and the cluster relies on a broad network of actors. The production is also directed to high quality wines and this is supported by the creation of a specific, local vinification method and by consistent investment in the industry (Larreina and Aguado 2008: 163). The authors argue that the city of Logrono has become an ‘oenopolis’ linking its economic and social development to wine. The wine cluster has developed in an important and broadly networked structure.
Figure 4. The Rioja Wine Cluster
Source: Larreina and Aguado (2008:161)

South Africa

South Africa has a relatively long history in wine making even if until the late 19th Century its most recognized products were dessert wines. With an influx of Italian and German wine makers at the beginning of the 20th Century a larger scope for wine production had begun and in 1918 the Koperatiewe Wijnbouwers Vereeniging Beperkt van Zuid-Afrika (Co-operative Wine Growers Association Limited of South Africa – KWVBZA) was created. In practice, this was to become the monopolist controller for the whole industry. Only in 1997, after the end of the apartheid regime in 1994, did the industry privatize. From the policy point of view, two important sets of decisions shaped the South African industry. The first is the deregulation of the wine sector that occurred in 1995. This broke with three decades of intense control by the government of actors in the sector mostly through the use of individual quotas for planted areas and grape prices based on volumes. The KWVBZA, which was set up as a cooperative between
1918 and 1997, was the organization in charge of this activity and it aimed at maintaining high prices for the product in a small domestic market. In organizational terms only a few large estates were exempt from joining the KWVBZA and this led to a widespread membership in cooperatives (Wood and Kaplan 2008). For grape producers sales of their products were mandated through cooperatives. Because prices were set on volume rather than quality most producers had very few incentives to improve their viticulture and vinification practices. This generated a ‘two-speeds’ system with a minority of companies producing good wine and the bulk getting by with below average products. Since 1973, South Africa has had a Wine of Origin certification scheme, which indicates a certain area of origin for the product. The certification ensures the consumer that 100% of the grapes from which the wine was made come from that area. In 1993, three geographical units were instituted in South Africa for wine regions: Western Cape, Northern Cape and KwaZulu-Natal. Until 2004 the wine was subject to an ‘estate’ definition, according to which estate wineries could only make wine from grapes that they grew on land they owned. After 2004 an ‘estate wine’ appellation was created, which allowed these companies to crush grapes that were produced on land not owned by the estate as long as the vineyards were contiguous and they were farmed as single units. Today, all wines sent for export are tested at the Wine and Spirit Board at Nietvoorbij, Stellenbosch.

It was only with the elimination of the quota approach in 1995 that the system of disincentives it supported came to an end. The South African wine sector went through a process of redevelopment that was very similar to what had happened to many other new world producers: replanting of new varietals was undertaken especially of grapes that were in demand on the international market like shiraz, merlot and cabernet sauvignon. In 2008, 49% of all hectares of vines had been planted within the last 10 years, and 70% in the previous 15 years (SAWIS 2009: 13). Along these sector specific changes, the government of South Africa introduced a series of reforms that affected the general economic environment in a manner favourable to the development of the industry. Among these changes was the introduction of minimum wages for agricultural workers, land reform, the reduction of subsidies to the sector and a general liberalization and deregulation of the agricultural production and trading chains.

The South African wine cluster is relatively small in terms of world markets representing only around 3% of both wine production and world exports. However, the latter have increased in a very marked way since the mid-1980s when they accounted for only 0.10% of world total (OIV
In 2008, South Africa’s biggest customers were the United Kingdom and Germany (SAWIS 2009: 27). Like other new world producers seeking to market their wines abroad the South African companies have tried to develop a ‘novel’ wine that would separate them from the more traditional European products. In the case of the African country, pinotage was the product of choice. In South Africa the recent development of the wine industry has seen an early increase in the amount of small companies followed by concentration. It should be noted that while the number of what Wines of South Africa (WOSA) calls primary wine producers dropped from 4,786 in 1991 to 3,999 in 2007, over the same period of time the number of wine cellars that crush grapes increased from 212 to 560. The industry has been analyzed in terms of clusters by Wood and Kaplan (2005; 2008). In this analysis the authors identify four categories of wine producers: established producers, which existed before 1994, new producers, which were established after this date, cooperatives and wholesalers (some of which produce wine). It should be noted that both new and established producers make boutique wines, which have driven most exports, but the difference in size warrants the separation in the analysis. Cooperatives are very important in terms of volume, as they crush about two thirds of grapes (Wood and Kaplan 2008: 110). If cooperatives are crucial to wine production, wholesalers dominate wine sales.

The South African wine sector enjoys a strong institutional framework. The most important coordinating agency is the Wine Industry Network for Expertise and Technology (WINET), which brings together all facets of the industry, including science and technology. The board of WINET has members of all the various groups involved in the industry; it organizes industry meetings and allocates funding for research in the area that is then broadly disseminated. A key role in this research is played by the Agricultural Research Council, which brings together a comprehensive network of research institutes specializing in oenology, viticulture, soil science and so forth. WINET also acts as advisory council to the South African Wine and Brandy Company (SAWB), which is a broader representative structure for wholesalers, producers and workers. Another critical institution in the area of technical research is the Nietvoorbij Institute for Viticulture and Oenology, which is engaged in advanced research and cooperates with the University of Stellenbosch and the Elsenburg Agricultural College.

South African attention to exports grew in the late 1990s and, in 2000, the international marketing of wines was given to Wines of South Africa (WOSA), which represents over 500
exporters and has as its goals to develop the capacity of the country’s wine makers and to facilitate wine tourism. This is done by coordinating industry exhibitions and attracting foreign wine experts to South Africa but also through the creation of export structures in Canada, Germany, Russia, Sweden, the Netherlands, the UK and the USA to foster its mandate. Wood and Kaplan (2008: 112-113) noted that the wine industry actors they interviewed saw the role of Wines of South Africa as an important and beneficial element in the national strategy to develop the wine industry. In particular, the organization was perceived as having had a major role in developing an appreciation of South African wines abroad. Domestically, WOSA also managed to generate a different approach to marketing among actors: in particular the smaller companies that would have more difficulty in creating an independent marketing strategy have relied on the agency. In 2002, South Africa signed a Wines and Spirits Agreement with the European Union, which allows the African country to export for ten years up to 42 million litres of wine to the EU without paying the Common Customs Tariff.

The SAWB focused on developing and innovative wine industry that would aim at establishing itself as an exporter of quality wines. While members of the South African wine industry compete for customers among themselves, they also show clear signs of cooperative behaviour in areas like marketing and innovation (Wood and Kaplan 2008). Innovation in particular has affected the type of marketing that has been chosen and the type of wines that have been produced especially for the export market but also for domestic consumption. According to Wood and Kaplan (2008) established firms mostly focused on production innovation especially in viticulture by replanting with new varietals that were a good match for the South African terroirs. Established producers also engaged in a strong cooperative approach in the exchange of knowledge in the production, viticulture and viniculture areas. They also tended to take part in research projects that were driven by the research network that was linked to Winetech. While this cooperative approach did not replace the use of consultants, it represented an important addition to their knowledge base that the smaller companies did not have access to. In terms of marketing Wood and Kaplan (2008) noted that the established producers employed two strategies. The first one, which they call ‘market-focused,’ saw producers relying on a strong local presence for their products; demand for the latter was very strong, and producers used consultants broadly. When these companies looked at international markets, they were very well informed regarding what sold there. In this case, export strategies
passed through WOSA. The second strategy relied on ‘broad markets’ and those firms that embraced it tended not to be as selective in terms of where they sold they product. Perhaps this reflected their need to clear extra supply.

The most successful firms according to Wood and Kaplan (2008) were financially stronger, invested more in innovation, were in closer contact with the institutional framework of the South African wine industry in the areas of marketing and of research and technology, made broad use of consultants, and had a clear marketing strategy. Among the wine companies in South Africa new comers are more likely to engage in exports but the country has not done as well as other new world producers. Wood and Kaplan (2008) highlight the weakness of the marketing process as a critical limitation in the success of the industry.

United States

The US wine industry remains an important part of world trade. But it is not one of the most export oriented countries. The California wine cluster centered around the Sonoma, Santa Clara and Napa Valley and the University of California at Davis. It is one of the most important centers of New World wine production. California accounts for about 90% of all US wine production (OVI 2006). The history of winemaking in California goes back to the 1860s but, like in other new world producers, the yield was generally of a low quality and made from generic grapes. However, among these products could already be found in the late 1800s some very marked differences like the vineyards of Henry Pellet or Gustave Niebaum. Here we find better grape varietals and cutting edge winemaking. The Napa Valley producers have a long history of organizing to create a substantial network in the area: as of 1881 there was a Napa Valley Viticulture Society and a strong cooperative approach was being followed (Patchell 2008). At the beginning of the 20th Century, the Californian wine industry was facing very complex challenges and in 1902 the California Wine Association (CWA) was created. Controlling about 75% of the production this was a rather commercial enterprise that quickly proceeded to homogenize California products. Napa Valley producers kept their independence and had very few connections with the CWA, some even tried to oppose the move, but the era of prohibition was close at hand. With the laws promulgated under prohibition the winemakers were forced to shift their varietals to grapes that could weather transportation. Still, some high
quality wines remained and at the end of prohibition the more dynamic winemakers began attracting European specialists and focusing on good quality varietals. These were the years when Mondavi arrived in California and between the 1930s and the 1950s the organizational strength of the industry recovered with the creation of the Napa Valley Vintners Association (NVVA) and of the technical clearing house that was to become the Napa Valley Technical Group. The latter served both as a link with the school of oenology at UC Davis, and as vehicle for the transmission of this knowledge through the network. This was a period of great growth in winemaking quality but not necessarily in the creation of estate wineries. In fact, the industry was going through a process of integration that relied heavily on bulk production: by 1960 only 25 wineries could be counted in Napa (Patchell 2008).

However, a new period was being ushered in by small, independent and dynamic winemakers who began looking at *terroir* and boutique winemaking. The number of producers rose again and so did the quality of the products. The so called ‘Judgement of Paris’ of 1976 represented the moment at which the Californian wine became ‘quality’ wine. The 1960s and 1970s were crucial years for this shift towards a *terroir*-based production. As the public responded positively to the new type of wines being created here the business grew. The new approach meant that more and more wineries produced their own grapes. If in the 1960s winemakers owned only one quarter of the vineyard in 2008 the owned about two thirds (Patchell 2008).

Like in most other new world producers the process of consolidation in the Napa Valley has been ongoing and large multinational corporations like Constellation have played a critical part in the process. However, there still is a large number of the small and very small producers that survive and at time thrive in the new model.

The quality of the production did not go unnoticed and while the US does not export as much as say Australia or Chile, it still is an important player in terms of quantities. In 2004, the EU and the US signed an agreement that allowed for the export of bulk California wine, which represent about 70% of American exports to the EU, under favourable terms for local bottling and resale within the EU (Perini 2010: 7).

In terms of institutional structures, Napa Valley winemakers have a very articulated model in place. The relationships between grape growers and winemakers have developed according to Patchell (2008) as a result of the intense struggle that they had to engage in when in the mid-1970s they tried to develop an appellation system that would fit their product. Winemakers and
grape growers alike are very much aware of the specificity of the Napa terroirs and they have achieved important results in their attempts at having this recognized through regulation and most of the wineries subscribe to this approach (Patchell 2008). Because of the reputation of Napa wines many large corporations have been trying to associate themselves with the area and sometimes this results in bulk wine being sold under recognizably Napa brands. Because of the way in which the appellation system works these companies are able to use non-Napa grapes for their wines.

Porter (1998) highlighted the importance of the Californian wine cluster in the wine sector of the United States. This is a cluster with both vertical and horizontal links among its actors. Growers and wineries are at the core of the process in California and upon them hinges a broad set of companies and institutions that provide the winemakers with services and goods in both the upward (viticulture) and downward (winemaking) stages of wine production. Also important are the supporting activities of both government agencies and educational and research institutions. Connected to the wine clusters are three other clusters: the agricultural, the food and the tourism ones. The knowledge diffusion and the cooperative behaviour of many of these firms have fostered important gains for the sector. A high percentage of the wine companies of the California cluster remains well embedded in the territory notwithstanding the increased concentration of the industry.
Figure 5. The California Wine Cluster

Source: Porter 1998: 79
Some initial conclusions can be put forward at this point. Regarding New World producers, not all clusters seem to lead to the same results. For example, New Zealand, South Africa, Australia and Chile fall within the export oriented and very export oriented but while New Zealand and Australia have relatively strong networks, the same cannot be said for the other two countries. The Napa cluster is quite renowned but the US does not figure among the major export players. Canada and Argentina on the lower end of the spectrum both seem too present a correlation between weak clusters and low-export orientation. What appears to show a strong correlation is the presence of a strong organizational/associational structure and a strong export orientation that is dedicated to the purpose, matched with a relatively small domestic market. Canada and Argentina, which can rely on relatively large domestic markets in comparison with their production seem to have felt less the need to internationalize their retail strategy. This is true, if to a smaller degree, of the United States. The case of South Africa is interesting in that while the cluster does not seem terribly developed, certainly not as much as the US or Australia, we still find a good level of institutional support. In other words, a dedicated export-supporting organization could reasonably be created even in the absence of strong clusters. An export strategy may therefore be viable even under these conditions.

The cluster model that was so successful in many new world countries may be more difficult to broadly export to the European landscape where various historical and practical realities exist that seem to create important limits to the innovation patterns that modern clusters require (Ditter 2005). Some examples of modern clusters exist in Europe like the Rioja one (Larreina and Aguado 2008).

This review seems to point towards the fact that different types of clusters or perhaps quasi-clustering behavior, will be found in the various national realities. Because of the long-standing nature of winemaking in all of the countries in the sample, going back at least to the late 1800s, and to the particular nature of wine making geographical clustering exists in all of these nations. In this sense the organization of clusters in informal, organized, and innovative (Mytelka and Farinelli 2000; Farinelli 2007) may be helpful. The table below presents a temporary classification of clusters based on the existing literature.
In this sense our research will improve on the existing knowledge allowing us to test existing clusters in a more homogenous manner and develop an analysis of the relationship between existing innovative clusters and exports or the development of boutique wines. For example, we know that innovative clusters in Napa and South Australia have both been actively seeking export markets and in developing higher end wines. Of particular interest would be to look at which variables distinguish organized clusters from innovative ones and how the former may be nudged into the innovative area.

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3 According to Giuliani (2006) the Bolgheri/Val di Cornia network is split in two parts one informal and one that is certainly organized and may even verge on innovative.
References:


Mytelka L.K. and Farinelli F. 2000. Local Clusters, Innovation systems and Sustained Competitiveness. *Discussion*


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i There is not a complete consensus in the literature on what the geographical distance between the actors should be. This is complicated by the emerging literature of global pipelines, which underscores the relevance of communication channels companies build with specific providers located outside their local cluster (Bathelt, Malmberg, and Maskell 2004; Gertler and Levitte 2005). However, these limits can be overcome by using a multi-layered approach.

ii New World producers are those wine makers that emerged during the 20th Century outside of the traditional European wine-making regions. They include Australia, New Zealand, Canada, Chile, California, and South Africa.

iii An important niche for Canadian wine sales is ice-wine; Taiwan is the largest importer of this Canadian product (Hope-Ross 2006: 8).

iv Hickman and Padmore (2005: 89) define these categories as follows. “(i) growing and viticulture, which refers to the propagation, growing, cultivation and harvesting of grapes; (ii) making, which includes crushing, fermentation, finishing and packaging; (iii) marketing/product design, which refers to that aspect of marketing where firms attempt to discover consumer needs and desires and design products to fit; (iv) marketing/selling, which includes distribution, wholesale and retail sales, advertising, promotion and public education; and (v) business processes, which include management, financial and personnel systems.”