



AMERICAN ASSOCIATION OF WINE ECONOMISTS

AAWE WORKING PAPER

No. 46

Business

INNOVATION IN THE CHILEAN WINE
INDUSTRY: THE IMPACT OF FOREIGN
DIRECT INVESTMENTS AND
ENTREPRENEURSHIP ON
COMPETITIVENESS

Martin Kunc and Tomas G. Bas

September
2009

www.wine-economics.org

**Innovation in the Chilean Wine Industry:
The Impact of Foreign Direct Investments and Entrepreneurship
on Competitiveness**

Martin H. Kunc
Warwick Business School
martin.kunc@wbs.ac.uk

Tomas G. Bas
School of Business
Universidad Adolfo Ibañez

Working Paper

ABSTRACT

In this paper, we present the evolutionary path occurred in the Chilean Wine industry generated by learning-by-imitation processes occurred after foreign direct investments improved few existing firms as well as created new firms. This process of learning-by-imitation was fostered by the development of knowledge networks and the arrival of highly qualified entrepreneurs.

1. Introduction

Innovation processes in natural resource-based industries generated enormous wealth in developing countries. One of these examples is the wine industry. The New World of Wine countries like Australia, South Africa or Chile have displaced from key markets to Old World of Wine countries like France, Spain and Italy (Anderson, 2005). This paper presents a review of the process, and its drivers, of competitive development¹ occurred in the Chilean wine industry in the last 20 years.

The literature on the development of industries based in natural resources (e.g., Perez-Aleman, 2005) have proposed to focus on the emergence of institutions that make possible learning-by-monitoring² as a way to obtain a competitive development. However, we suggest that competitive shocks occurred by the arrival of foreign competitors generate a learning-by-imitating³ process that upgrades production functions in local firms through knowledge networks and, later on, foster the entry of local entrepreneurs with higher sophisticated production functions to the industry contributing to the development of its global competitiveness. Only after the upgrading in the industry consolidated, clustering processes took shape and transformed the wine industry into a knowledge-based cluster as described in Giuliani and Bell (2005). One of the contributions of this paper is to present the emergence of a globally competitive

¹ Competitive development can be associated to the process of firm upgrading. Firm upgrading refers to the capacity of a firm to increase the value added of its products (Giuliani, Pietrobelli and Rabellotti, 2005). The process of upgrading is intrinsically related to innovation in the production function of the firm and innovation is an outcome of knowledge obtained through interactions between networks of existing firms, foreign direct investments and local entrepreneurs.

² Sabel (1994) suggests a theory for economic development known as “learning by monitoring”. In this model, learning is driven by rules or practices to coordinate economic activity between actors, enhancing the conditions for individual and collective learning and innovation (Perez-Aleman, 2005).

³ In this process different channels are used – such as technical publications, the examination and links with suppliers, customers, and competitors, as well as the participation at events (e.g. trade-fairs) – to obtain the knowledge acquired for innovating. While it starts as an imitation process, it involves later the improvement and the conceptualisation of acquired knowledge (Carbonara, 2004).

natural resource-based industry based in a knowledge-based cluster (Breschi and Malerba, 2001).

The paper is organized in the following sections. In section 2, we present the characteristics of the natural resources-based industries. We follow with a description of the role of foreign direct investments in the shocks generated to the existing industry agglomerations around resource endowments (section 3) and the emergence of knowledge clusters replacing the existing agglomerations (section 4). The evolution of the Chilean wine industry is described in section 5. Finally, conclusions are presented.

2. Natural-resource based industries as agglomerations

Industrial agglomerations are groups of firms belonging to the same industry or closely related industries located in a certain area that could potentially, but not necessarily, interact. Among other factors, Marshall (1920) suggested that a reason for the agglomeration of certain industries was physical availability of resources. Later on, Ellison and Glaeser (1999) suggested that industries based in natural resources tend to agglomerate in certain areas because of the cost advantages given by the natural resource endowments. When interactions occur in this agglomeration, they are basically buyer–supplier interactions based on market transactions guided by price considerations rather than social relations or norms, which did not foster the transfer of knowledge. Thus, the density of similar firms within a geographical area is the main defining feature of agglomerations (Rocha and Sternberg, 2005). The distinction between clusters and industrial agglomerations is relevant because industrial agglomerations are not considered as entities in themselves since they lack inter-firm and institutional networks that provide the necessary connections between the different

actors within the agglomeration (Rocha and Sternberg, 2005). Only the combination of resource availability, lower entry and exit barriers, reduced transaction costs and market size within industrial agglomerations based in natural resources positively affects the creation of firms (Sorenson, 2003), but these factors also generate more competition. More competition leads to the depletion of the common resource base and, consequently, a decrease in start-ups implying a limit to the growth of the agglomeration and poor economic performance since they sell commoditized products without added value.

In many cases, individualistic attitudes and lack of resources of existing firms in agglomerations restraint the development of collective learning and impose a limit on the development that the local industry can achieve. Contrary to agglomerations based in resource endowments, clusters are regional phenomenon because of their inter-firm and institutional geographically bounded networks (Rocha and Sternberg, 2005; Sorenson, 2003; Porter, 1998). Therefore, natural resource endowments may be important for region development but the capacity to add value to the natural resource in ways that produce superior results in global markets is even more important (Bas and Niosi, 2001; Perez-Aleman, 2005). In other words, natural resource-based industries should move from comparative advantage to constructed advantage, where the advantage is constructed in terms of knowledge rather than in resource endowments (Cooke and Leydesdorff, 2006). However, there is more than one way that agglomerations can turn into successfully global competitive clusters. In this paper, we will review the effect of foreign direct investments as drivers of learning-by-imitation process for firm upgrading.

3. Shocks to agglomerations: the role of foreign direct investments

Some people argue that foreign direct investments in developing countries have negative effects due to strong competition in product and labor which crowd out indigenous firms (Spencer, 2008; Goedhuys, 2007). Others researchers suggest that foreign direct investment by multinational enterprises can benefit local firms because they bring new technologies that can be spilled over existing firms or local entrepreneurs (Spencer, 2008). However, an important effect of the entry of a foreign firm in an agglomeration is the disturbance of the existing equilibrium in the market, which makes local firms react so as not to lose their market share and profits. In some cases, local firms react by innovating and upgrading their production functions to being able to compete against foreign firms. To react, these firms need to tap into new knowledge originated from foreign direct investments spillovers, networks of local firms or through alliances and joint ventures with other foreign firms.

There are a number of mechanisms for knowledge acquisition for local firms from foreign direct investments: demonstration effects, vertical and horizontal linkages with local firms and employment and labor turnover (Breschi and Lissoni, 2001; Spencer, 2008; Goedhuys, 2007). Demonstration effects refer to a situation where a local firm improves its efficiency by copying technologies or managerial and/or organizational innovations of foreign affiliates operating in the local market. Vertical linkages are generated from the linkages of the foreign firms with local suppliers and distributors (Lim and Fong, 1982;). When foreign firms buy from local suppliers, their requirements can be transferred as new knowledge to suppliers' local buyers (except when foreign firms request suppliers to sign exclusive agreements). Another set of linkages is generated from the export activities that the foreign firm performs. Since multinationals often have better knowledge about external markets and how to reach

them than local firms, their presence in the local market can help local firms to learn how to export or to become more efficient at exporting. Horizontal linkages originate with the interaction with similar firms through joint ventures or alliances. In this case, foreign firms want to have access to local resources which can be employed more efficiently using their know-how. Finally, knowledge diffusion effects from employment and labor turnover from foreign firms are related to improvements in the existing human capital in the industry (Santarelli and Vivarelli, 2007). Foreign firms' investment in training local workers helps local workers to acquire new knowledge, which spillovers to the rest of the agglomeration through labor turnover or individual entrepreneurship. To summarize, foreign direct investments can generate positive effects in the agglomeration where they are located through different knowledge transmission mechanisms which are directly related to the upgrading of the production function of local firms.

4. The emergence of clusters as knowledge networks after the shock

Knowledge spillovers, a key element of the innovative activity, tend to be spatially restricted especially when they are based on tacit knowledge (Coenen et al, 2006; Johnson et al, 2002; Audretsch and Feldman, 1996). This characteristic of tacit knowledge implies that foreign direct investments in spatially concentrated industries may be responsible for clustering processes in the economic activity via the concentration of knowledge and the development of knowledge networks of local firms in regions.

Since the tacit components of technological knowledge makes its transfer and application costly and difficult, non-market relationships are a critical dimension to

define the grouping of economic activities in a certain region (Giuliani *et al.* 2005; Hakanson, 2005) and its dynamics in terms of innovation. Knowledge, and innovation, can develop faster in regions with a certain specialization, like wine, because the visibility of the production of innovators is significant and imitation of technology is easier. Thus, non-market networks of people sharing similar issues, like in specialized regions, can facilitate innovation processes even when there is no explicit co-operation within the market. The regional networks of embedded relations can replace market relations as a venue for the development or emulation of innovations (Lambooy, 2004). Gradually, the agglomeration of individualistic firms is turned into a cluster of firms based in common practices and knowledge exchange processes that are the basis for learning-by-imitation processes (Malmberg and Power, 2005).

However, the degree of absorption of firms agglomerated in a region to new knowledge from foreign direct investments is tied to the degree of openness of its member firms and institutions as well as the capacity to absorb knowledge (Cohen and Levinthal, 1990; Bell and Albu, 1999; Giuliani and Bell, 2005). Thus, firms with higher absorptive capacities in the region are more likely to establish linkages with external sources of knowledge such as foreign firms or learn from them (Nieto and Quevedo, 2005). Therefore, firms will exchange knowledge depending on: (i) the amount of knowledge they have accumulated over time, (ii) their capacity to decode and absorb knowledge that is potentially transferable from other cluster firms and (iii) their level of networking with other firms internal and external to the cluster (Carbonara, 2004; Giuliani and Bell, 2005).

In an increasing clustering process, non-market factors such as sociocultural and institutional factors appear to be as important for industry dynamics as natural resource endowments (Malmberg and Maskell, 1997).

4.2 Clusters and Entrepreneurship

Clusters add three important mechanisms to foster entrepreneurship: inter-firm relationships, legitimation, and complementary linkages (Rocha and Sternberg, 2005). These mechanisms contribute to overcome the limitations of new business models to be learnt, unknown resources and lack of ties with customers and suppliers. In addition, clusters through their established networks facilitate tacit knowledge flows. Tacit knowledge flows, like wine making techniques or marketing strategies to enter into external markets, encourage the motivation and decision to start a new business due to the higher probability of understanding the business model (Santarelli and Vivarelli, 2007). Thus, the existence of networks within regions promotes entrepreneurship (Rocha and Sternberg, 2005; Rocha, 2004). Opposite to an agglomeration around a natural resource endowment, the resource shared in a cluster is knowledge. Internal and external networks help individuals to identify opportunities and threats beyond the geographical boundaries of the region, thus encouraging individuals to launch new firms in the region based on the knowledge available through the network (Feldman, 2001; Scott, 2006; Kunc, 2006). Therefore, entrepreneurs that enter into the industry with higher levels of knowledge than existing firms add more value to similar resource endowments fostering the competitive development of the industry.

To summarize, the impact of foreign direct investments have a learning-by-imitation effect on upgrading the production function of existing firms. Once existing local firms

learn, this knowledge is transferred through networks and facilitate, as well as foster, the entry of more sophisticated entrepreneurs that increase the economic performance of the natural resource based industry as figure 1 suggests.

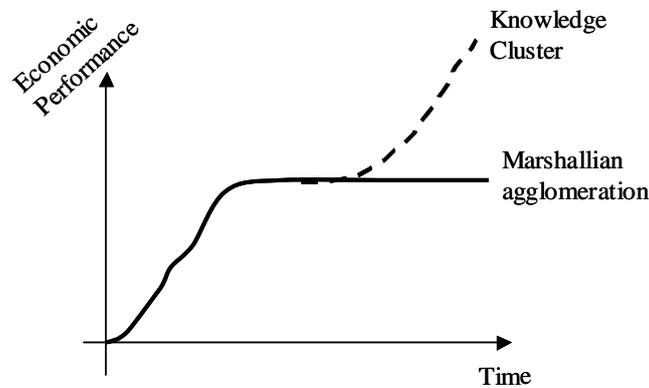


Figure 1. Comparative economic performance of natural resource-based industries based on Marshallian agglomerations and knowledge clusters

5. Chilean wine industry: from agglomeration to globally competitive clusters

In this section, we present a review of the path followed by the Chilean wine industry in the last 20 years. The review is based on secondary data analysis directed by initial interviews with key people in the main industry associations.

5.1 Overview of the Chilean wine industry

Chile has thirteen clearly identified wine regions located in a range of 1000 km (600 miles), from north to south: Elqui Valley, Limari Valley, Aconcagua Valley, Casablanca Valley, San Antonio Valley, Maipo Valley, Cachapoal Valley, Colchagua Valley, Curico Valley, Maule Valley and the south region comprising Itata Valley, Bio Bio Valley and Malleco Valley (Knowles and Sharples, 2002). However, the majority of Chile's premium wines are made in the wine regions of Maule, Maipo, Aconcagua, Cachapoal and Colchagua, which are close to Santiago, Chile's capital city (Sharples,

2002). Regional agglomeration is thus relevant in the industry. However, marketing, administrative, strategic decision-making, and representative functions of the larger wine producers are concentrated in Santiago (Visser and de Langen, 2006). This city also accommodates the national wine business associations, two of the three specialized university R&D institutes, most of the graduates in wine specialized degrees, public agencies involved in the development of the wine industry, as well as specialized information brokers (Visser and de Langen, 2006). Santiago is the strategic center of the wine industry but the production is regionally clustered in thirteen valleys in Chile.

With respect to industry structure, the Chilean wine industry is more concentrated than in continental Europe, but less so than in other New World wine producers. In 2005, the four largest wineries in Chile accounted for 42 percent of wine export value: Concha y Toro (22.0%), San Pedro (7.0%), Santa Rita (6.8%) and Cono Sur (6.0%) (Chilevid, 2006). Most of the suppliers are foreign firms that established their subsidiaries attracted by the growing Chilean industry or local firms that import foreign products. Global suppliers, e.g. Italian manufacturing firms, established in Chile only recently attracted by the growth of the industry rather than pioneered its development. Similarly, industry associations, e.g. Viñas de Chile and Chilevid, were created or renewed in later 1990s when the industry consolidated its development, e.g. Viñas de Chile was created in 1950 but it achieved a relevant place promoting exports in late 1990s following the industry growth. Supporting R&D by universities and public funded research is concentrated in few institutions: three universities (Pontificia Universidad Católica, Universidad de Chile and Universidad de Talca) and few governmental agencies (CONICYT, the Chilean government agency for scientific research) with a low level of public and private investment. From 1996-2005, the public sector invested in research only US\$ 7 million, which represents only 0.1% of the total accumulated exports during

the same period, in 53 projects; and most of them (80% of the projects) were started between 2000-2005.

5.2 The shocks to the industry agglomeration: foreign direct investments during 1980s and 1990s

Oliva and Suarez (2007) and Suarez and Oliva (2005) found that firms operating in Latin American economies suffered significant uncertainty in the competitive environment during the period immediately following economic reforms in early 1990s, only after reforms started to settle in the mid 1990s the environment's capacity to sustain growth increased and industries developed (Suarez and Oliva, 2005; Oliva and Suarez, 2007). Figure 2 shows the development of Chilean wine industry from 1979 until 2005. There were two key periods. The first period was mostly driven by foreign direct investment in subsidiaries (arrow 1 in figure 2) and the second period was determined by the entrants of local entrepreneurs and joint ventures between existing firms and foreign direct investments (arrow 2 in figure 2).

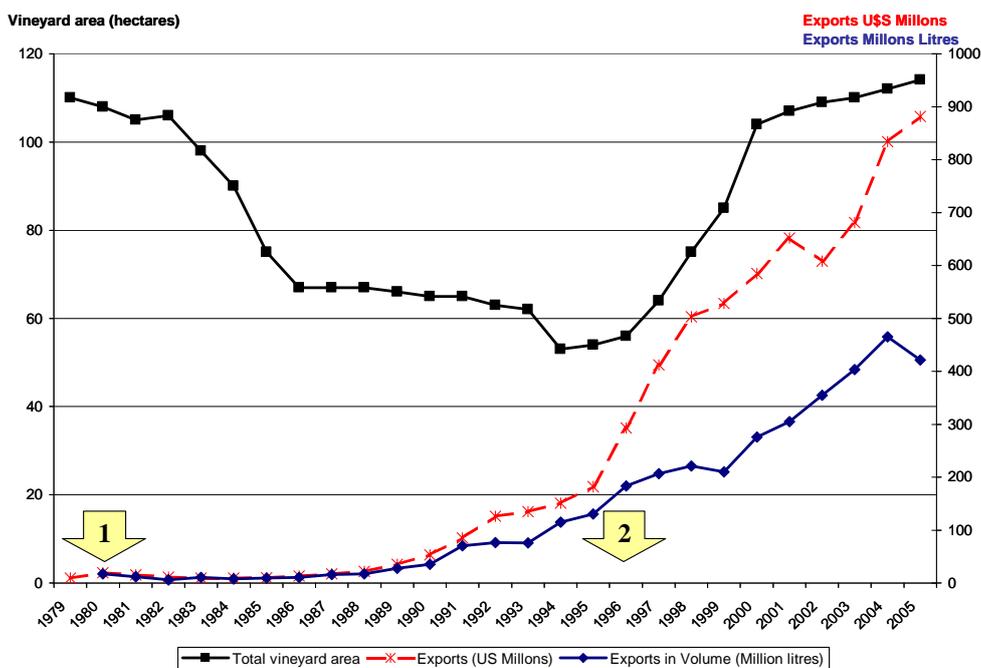


Figure 2. Chilean wine industry development and main Shocks to the Chilean Wine Industry

Beginning in 1980, industry liberalization and the country's economic opening kicked off a revolution in the wine industry (Knowles and Sharples, 2002). The arrival of foreign wine makers, such as Miguel Torres in 1979 (arrow 1 in figure 2), helped to introduce new technology to a strong but internal market oriented Chilean wine industry which led to a replacement of many of the old methods of production with new technology (Knowles and Sharples, 2002). Tanks made of rauli (an indigenous tree) wood were replaced with temperature-controlled stainless tanks, from zero in 1979 to almost 30% of total storage capacity in 1998 (Walters, 1999) and more than 50% of total storage capacity in 2003 (SAG, 2003). French and American oak casks began to fill the barrel rooms reaching more than 15 percent of storage capacity by 2003 and becoming a norm for new wineries. Modern facilities were designed to incorporate gravity-flow design and other stylistic aspects to encourage wine tourism. By introducing new technologies and ideas that at the time was commonly unknown, Miguel Torres and other foreign direct investors created demonstration effects that led local firms to imitating them. After trade liberalization, domestic firms were able to import new technologies and ideas themselves so demonstration effects were fully implemented in the industry (albeit using external rather than internal sources of technological change (Cimoli and Katz, 2003). While foreign direct investment was only US\$ 24 million from 1975 to 1990, foreign direct investment total was US\$ 94 millions between 1990 and 2001 (Farinelli, 2003). This amount only represents 30 new wineries with an average size of 100 hectares considering capital costs for new wineries in US\$ 3 millions using McDermott, Feters and Echeopar's (2003) calculations.

The distribution of local and foreign wineries in terms of wine regions is shown in table 1. Interestingly the presence of foreign firms in the industry is quite low in terms of the total industry size, as table 1 shows, but demonstration effects usually related to highly visible technologies like stainless steel tank or cellar facilities design were important.

Valley	Total Area (hectares)	Foreign Firms		Local Firms		Percentage of total area under foreign firms
		(total hectares)	(average age)	(total hectares)	(average age)	
Elqui + Limari	2000	0	0	2000	10	0%
Aconcagua	2300	120	10	2180	10	6%
Casablanca	3600	900	10	2700	10	33%
Maipo	9500	450	12	9050	40	5%
Cachapoal + San Antonio	9500	420	15	9080	60	5%
Colchagua	17000	1000	15	16000	45	6%
Curico	19000	400	28	18600	65	2%
Maule	25000	400	18	24600	75	2%
Itata + Bio Bio	12000	50	10	12000	30	0%

Table 1. Distribution of Foreign Wineries in Chilean Valleys in 2005

However, Bjork (2005) suggests that spillover effects in the form of management and organizational practices, which are most difficult to understand given its tacitness, were not important. Perhaps, the most important effect is that Miguel Torres disturbed the existing equilibrium in the market and made local firms react not to loose their market shares. Nevertheless, this innovation did not produce a radical innovation in the industry and exports remained relatively flat because most of the exports were cheap bulk wine targeted to the lowest price international market segments (see figure 2).

A second innovating shock started by mid 1990s (arrow 2 in figure 2) and it was generated by new foreign entrants with experience and desire to sell premium wine to sophisticated markets segments that associated with local producers. Worldwide well-known wine makers such as Baron Philippe de Rothschild (France) and Robert Mondavi (USA) have installed in Chile to produce in joint ventures with local producers

premium and ultra premium wines. There were important tacit knowledge transferences as many foreign firms chose to establish in Chile through joint venture agreements oriented to the production and commercialization of high price wines, which was one of the segments in the market where Chilean wine industry was weak. These joint ventures controlled 30% of the high price segment (Bustos et al, 2007). These effects were mostly seen through an increase in exports. Chilean wineries with foreign involvement were the first to export to a wide range of markets. Bustos et al (2007) showed that joint ventures between local wineries and foreign wineries obtained on average US\$ 4.9 per bottle while the export price of the Chilean wine was only US\$ 1.6 per bottle in the period 1998-2004. Success in the market translated into more specialization and a selection process of grape varieties, e.g. grapes that are appreciated in global markets such as Cabernet Sauvignon, Merlot or Pinot Noir replaced local grapes with low commercial value internationally like Pais as table 3 shows. This wealth generated from increasing exports based in grapes like Cabernet Sauvignon spill overs on grape growers since they received US\$ 1.2 per kilo of Cabernet Sauvignon compared with US\$ 0.69 for Pais.

Grape	Year						Growth 1979- 2004 %
	1978	1985	1992	1996	2000	2004	
	Hectares						
Major Grapes of High Enological Quality*	17,484	14,720	24,027	27,670	72,599	80,578	361%
Major Grapes of Low Enological Quality**	56,781	13,704	12,978	17,896	17,071	16,580	-71%
Other	28,769	38,715	21,825	10,437	14,206	14,898	-48%
Total	103,034	67,139	58,830	56,003	103,876	112,056	9%

* High Enological Quality grapes are Cabernet Sauvignon, Merlot, Pinot Noir, Cabernet Franc, Chardonnay, Sauvignon Blanc

** Low Enological Quality grapes are Pais grapes

Source: Walters (1999), SAG (2004)

Table 3. Grape Variety Growth Rate in Hectares

An additional effect of the arrival of foreign firms was the access to distribution channels in the major markets and the improvement of the Chilean wine image (Bjork, 2005). Therefore, co-operation through alliances or networking with a foreign winery was very beneficial for Chilean wineries especially for transmitting knowledge related to upgrading production functions like grape growing, wine making and wine marketing (Kunc, 2008). Another example of co-operation is the link between domestic firms and importers or distributors. Since small and medium size firms rely on the marketing knowledge and capacity of overseas distributors as well as importers to manage winerie's wine brand, lessons learned from foreign firms about successful co-operation between importers and distributors with small and medium size wineries was important in the following stage of the development of the Chilean wine industry (Kunc, 2008).

5.3 The shocks to the industry agglomeration: entrepreneurship during 1990s

The second part of the evolution and the highest impact (arrow 2 in figure 2) was determined by a group of local entrepreneurs, e.g. Viña Montes, as they targeted –and were very successful– the premium to ultra premium market segments in foreign markets (McDermott, Fetters and Echeopar, 2003). Knowledge from the foreign joint ventures about grape growing and wine making for high price wines was diffused through labor turnover, e.g. oenologists and managerial positions. Therefore, imitation processes were set in motion and in few years a number of new entrants (individual entrepreneurs, traditional families related to the agricultural industry but without investment in wine, and subsidiaries of Chilean business groups) established small to medium size wineries also known as ‘viñas boutique’ targeted to high price segments. Chilean wine exports started growing in volume and value, as figure 2 illustrates. While the top ten wineries existing in 1979 are still responsible for 50% of the exports

and 44% of the volume actually, their participation fell from 75% before the process began (Chilevid, 2006).

An important form of co-operation for new entrants was between former employees of large wineries or joint ventures with foreign firms and capital partners. A number of wineries belong today to some extent to strong capital partners, in many cases successful businessmen in other fields. One example is the San Pedro winery, an old and established winery, which was bought by the Luksic family, owners of a large beer-making company in Chile, and revamped. Another example is the Santa Rita winery where a financial group is involved in. McDermott, Feters and Echeopar (2003) found that 14 out of 25 start-ups in the industry during 1990s were started by persons not related to the industry. A large number of these entrants needed knowledge workers to be able to operate in a minimum competitive level.

To access new technology and new ideas local entrepreneurs and entrants often use foreign consultants. These consultants often came directly from abroad to change wineries or to start new wineries (Bjork, 2005; Hojman, 2005). The use of these consultants appeared to be an important factor for innovation in the Chilean wine industry. However, the development of the education system in general and more specifically of the wine education implied that Chilean graduates are also often employed. More than 300 oenologists graduated during the period 1990-2000 compared with only 50 oenologists in the previous decade from the three universities teaching wine related degrees (Bjork, 2005).

Another possible channel of knowledge transfer for new firms is through technical people (e.g. cellar operators) from existing firms. Such people are normally experienced technicians with many years in the industry and usually tied up to a certain oenologist.

This channel has been important in transferring information as well as tacit knowledge, which they accumulated during their fieldwork experience. Furthermore, such actors are probably the most socially embedded in the local environment as they have grown up in the area and ‘know what’ and ‘who’ very well.

Another type of co-operation in inter-firm knowledge transfer for new entrepreneurs in the Chilean wine industry is family-based: it is between members of the same family, either close or distant, who own or are part of the top management of different wineries (Hojman, 2005).

Actually, there are 300 wineries in the Chilean industry located in different valleys (Directorio Industria Vitinicola, 2006). More than 50% of Chilean wineries are less than 15 years old, which confirms that new entrants generated the growth observed in figure 2. The distribution of the wineries in terms of their age and size is shown in table 4. Most of the entrants have not been small wineries without resources since most of them have a reasonable size 79 ha, which – after five years – have grown five times on average (419 ha. for wineries more than 10 years’ old). Interestingly the evolution of the number of wineries in terms of size shows that micro wineries (less than 5 ha.) have not grown at all (SAG, 2004). New entrants entered at a minimum scale which was determined by the minimum level of capital related to an appropriate value chain to be able to survive in the industry (foreign consultants, full time oenologists and agronomists, state-of-the-art cellars, fully qualified management teams, etc.). In other words, most of the entrants were wealthy local entrepreneurs, part of diversification strategies from local groups and foreign firms, and not small grapegrowers who upgraded their productions.

	Percentage of wineries	Average Size (hectares)	Average Exports in 2005*	Total Exports in 2005*	Percentage of Total Exports in 2005*
Less than 10 years	32%	79	8,590,692	17,181,383	3%
Between 10 and 15 years	22%	413	13,410,098	67,050,491	13%
Between 15 and 20 years	17%	147	12,312,784	98,502,271	19%
More than 20 years	28%	714	23,887,314	334,422,408	65%

* Exports from top 35 exporting wineries which represent 60% of total exports

Table 4. Actual Distribution of Wineries in Chilean Wine Industry

6. Conclusions

Countries or regions based in natural resources industries have been viewed through the lens of development economics usually set in a framework of comparative advantage, which explained economic welfare in terms of initial resource endowments. Cooke and Leydesdorff (2006) suggest that policies under this view promoted comparative advantage through laissez-faire. The Chilean wine industry is a clear example of this type of thinking. The deregulation occurred during the late 1980s provided with a beneficial environment to exploit the existing resource endowments - in wine is the combination of soil and climate - by foreign and new entrepreneurs to an old and established but poorly performing industry. While this type of policy was heavily criticized by many authors as part of the “Washington Consensus” (Perez-Aleman, 2005), we should recognized that it was very beneficial for the Chilean wine industry which was in a very bad shape at the beginning of the 1980s. This decision turned it out into a major development of the competitive advantages of the Chilean wine industry because local entrepreneurs learned by imitating foreing firms fostering the competitive development of the industry.

In the Chilean wine industry, process and product innovations brought by foreign direct investors generated competitive advantage for local firms through learning-by-imitating processes. Technology upgrading as well as product innovation were drivers of the economic growth generated by imitation effects originated from the entry of foreign wineries in the Chilean wine industry. The role of large international markets was central to the explanation of Chilean wine industry. A different situation might have occurred if the market targeted by Chilean firms was mostly the local market. The small size of the local market would have not been enough to support the growth of their industry and foreign firms might have crowded out local firms. The high level of complexity existing in the actual international wine markets with multiple channels to reach out consumers and fragmented competition (Hall and Mitchell, 2007) implied that Chilean wine industry should have never achieved such a success if it did not open it to foreign direct investment and learned from them.

Cooke and Leydesdorff (2006) called this new competitive advantage as constructed advantage. This type of advantage requires interfacing developments in various directions such as regionalization of economic development amid 'open systems' inter-firm interactions in strong local and global business networks with multi-level governance and the development of knowledge infrastructure as well as a cosmopolitan and creative cultural environment. The Chilean wine industry achieved it partially.

In economic aspects, the Chilean wine industry has progressed enormously. However, Chilean wine industry has not advanced in aspects related to knowledge infrastructure as well as communities (Cimoli and Katz, 2003). In that sense, Chilean authorities have implemented a number of associativeness initiatives to continue transforming the industry into a knowledge-based cluster. However, clustering is not a universal and

deterministic model on how agglomerations can be turned into engines to regional economic growth. The empirical case for clustering remains in its development and policy makers make the mistake of jumping from successful case studies to general causality and applicability (Martin and Sunley, 2003). We presented a successful story: wine that followed a completely different path than other successful story: salmon (Perez-Aleman, 2005) in the same country.

We believe that the mistake originates from the lack of understanding of the relation between absorptive capacity and degree of local interconnectedness to the local knowledge system, as well as the misunderstanding of the concept of local knowledge spillovers (Breschi and Lissoni, 2001). Firms with lower absorptive capacities tend to isolate themselves and to be excluded from the advanced knowledge circles (Giuliani and Bell, 2005). Isolated firms have in fact been producing wine in the area for generations and interact with other local firms for productive purposes (trade of grapes and wine) but are excluded from local knowledge circles because they are not capable of decoding the knowledge that is flowing (Giuliani and Bell, 2005). Therefore, government policies should encourage or even subsidy hiring and generating knowledge workers to facilitate the upgrading through learning-by-imitation of those firms still struggling in resource-based industries. In other words, there are no 'pure' knowledge externalities but they are mediated by labour market and network agreements (Breschi and Lissoni, 2001). However, policy makers should realize the existence of heterogeneity in the pool of firms and be selective in choosing those firms endowed with entrepreneurs with progressive motivation to enhance highest rate of survival among them (Santarelli and Vivarelli, 2007).

7. References

- Anderson, K. (ed.) (2005), *The Worlds Wine Markets: Globalization at Work*. Edward Elgar Publishers.
- Audretsch, D. B. and M. P. Feldman (1996), 'R&D Spillovers and the Geography of Innovation and Production,' *American Economic Review* **86**, 630–640.
- Bas, T. G. and J. Niosi (2001), 'The Competencies of Regions – Canada's Clusters in Biotechnology,' *Small Business Economics*, **17**, 31–42.
- Bell, M. and M. Albu (1999) 'Knowledge systems and technological dynamism in industrial clusters in developing countries' *World Development*, **27**, 1715-1734.
- Björk, I. (2005), Spillover Effects of FDI in the Manufacturing Sector in Chile, *School of Economics and Management, Lund University. Unpublished master thesis*.
- Breschi, S. and F. Malerba (2001), 'The geography of innovation and economic clustering: Some introductory notes,' *Industrial and Corporate Change*; **10**, 817-833.
- Breschi, S. and F. Lissoni (2001), 'Knowledge Spillovers and Local Innovation Systems: A Critical Survey,' *Industrial and Corporate Change*, **10**, 975-1005.
- Carbonara, N. (2004), 'Innovation processes within geographical clusters: a cognitive approach,' *Technovation*, **24**, 17-28.
- Cimoli, N. and J. Katz (2003) 'Structural reforms, technological gaps and economic development: a Latin American perspective', *Industrial and Corporate Change*, **12**, 387-411.
- Coenen L., Moodysson J., Ryan C., Asheim B. and Phillips P. (2006), 'Comparing a Pharmaceutical and an Agro-food Bioregion: On the Importance of Knowledge Bases for Socio-spatial Patterns of Innovation,' *Industry and Innovation*, **13**, 393-414.
- Cohen, W. and Levinthal D. (1990), 'Absorptive capacity: a new perspective on learning and innovation,' *Administrative Science Quarterly*, **35**, 128-153.
- Cooke, P. and L. Leydesdorff (2006), 'Regional Development in the Knowledge-Based Economy: The Construction of Advantage,' *Journal of Technology Transfer*, **31**, 5–15.
- Ellison, G. and Glaeser, E. (1999), 'The geographic concentration of industry: Does natural advantage explain agglomeration?' *The American Economic Review*, **89**, 311-316.
- Farinelli, F (2003), 'Technological Catch-up and Learning Dynamics in the Chilean Wine Industry', *Conference on Innovation and Competitiveness in the New World of Wine*, 12 November 2003, Niagara, Canada.
- Feldman, M. P. (2001) 'The entrepreneurial event revisited: Firm formation in a regional context,' *Industrial and Corporate Change*, **10**, 861-890.

- Giuliani, E. and M. Bell (2005), 'The micro-determinants of meso-level learning and innovation: evidence from a Chilean wine cluster,' *Research Policy*, **34**, 47-68.
- Giuliani E., Pietrobelli C. and R. Rabelloti (2005), 'Upgrading in Global Value Chains: Lessons from Latin American Clusters,' *World Development*, **33**, 549-573.
- Goedhuys M. (2007), 'Learning, product innovation, and firm heterogeneity in developing countries: Evidence from Tanzania' *Industrial and Corporate Change*, **16**, 269-292.
- Hojman, D. E. (2005), Network Learning, Principal-Agent Conflict and Award-Winning Wine-Making in Chile's Colchagua Valley, *Research Paper Series No. 2005/12, Management School, University of Liverpool*.
- Hakanson L. (2005), 'Epistemic Communities and Cluster Dynamics: On the Role of Knowledge in Industrial Districts,' *Industry and Innovation*, **12**, 433-463.
- Hall, C.M. and Mitchell, R. (2007) Wine Marketing: A Practical Guide, *Oxford Butterworth-Heinemann*.
- Johnson, B., Lorenz, E. and B. Lundvall (2002), 'Why all this fuss about codified and tacit knowledge?' *Industrial and Corporate Change*, **11**, 245-262.
- Knowles, T and L. Sharples (2002), 'The history and development of Chilean wines' *International Journal of Wine Marketing*; **14**, 7-16.
- Kunc, M. (2006), 'Knowledge Management in Natural Resource Based Sectors: The case of Chile,' *3rd International Conference on Intellectual Capital, Knowledge Management and Organizational Learning, October 2006, Santiago (Chile)*.
- Kunc, M. (2008), 'A Survey of Managerial Practices in the Chilean Wine Industry,' *Journal of Wine Research*, **18**, 113-119.
- Lambooy, J. G. (2004), 'The Transmission of Knowledge, Emerging Networks, and the Role of Universities: An Evolutionary Approach,' *European Planning Studies*, **12**, XX-XX.
- Lim, L.Y.C., & Fong, P.E. (1982) 'Vertical linkages and multinational enterprises in developing countries,' *World Development*, **10**, 585-595
- Malmberg, A. and P. Maskell (1997), 'Towards an explanation of regional specialization and industry agglomeration,' *European Planning Studies*, **5**, 25-42.
- Malmberg, A. and D. Power (2005), '(How) Do (Firms in) Clusters Create Knowledge?' *Industry and Innovation*, **12**, 409-431.
- Marshall, A. (1920) *Principles of Economics 8th Edition*, London: Mcmillan.
- Martin, R. and P. Sunley (2003), 'Deconstructing clusters: chaotic concept or policy panacea?' *Journal of Economic Geography*, **3**, 5-35.

- McDermott T.P, Feters M. and Echeopar G. (2003), Entrepreneurship in Chile's Wine Industry during 1981-2001, *Working Paper, Center for Entrepreneurship – School of Business, Universidad Adolfo Ibañez, Santiago:Chile.*
- Nieto, M. and P. Quevedo (2005), 'Absorptive capacity, technological opportunity, knowledge spillovers and innovative effort,' *Technovation*, **25**, 1141-1157.
- Oliva, R. and F. F. Suarez (2007) 'Economic reforms and the competitive environment of firms,' *Industrial and Corporate Change*, **16**, 131–154.
- Perez-Aleman, P. (2005), 'Cluster formation, institutions and learning: the emergence of clusters and development in Chile,' *Industrial and Corporate Change*, **14**, 651-677.
- Porter, M. (1998) Clusters and the new economics of competitiveness *Harvard Business Review*, November-December, pp. 77-99.
- Rocha, H. O. (2004), 'Entrepreneurship and Development: The Role of Clusters,' *Small Business Economics*, **23**, 363–400.
- Rocha, H. O. and R. Sternberg (2005), 'Entrepreneurship: The Role of Clusters Theoretical Perspectives and Empirical Evidence from Germany,' *Small Business Economics*, **24**, 267–292.
- SAG (2003), Panorama de la Vitivinicultura Chilena en 2003, *Servicio Agrícola Ganadero – Chilean Government.*
- SAG (2004), Catastro Vitícola Nacional, *Servicio Agrícola Ganadero – Chilean Government.*
- Sabel, C. F. (1994), Learning By Monitoring: The Institutions of Economic Development in Smelser, N. J. and R. Swedberg (eds), *The Handbook of Economic Sociology, Princeton University Press*, 137-165
- Santarelli, E. and M. Vivarelli (2007) 'Entrepreneurship and the process of firms' entry, survival and growth,' *Industrial and Corporate Change*, **16**, 455-488.
- Scott, A. J. (2007) 'Entrepreneurship, Innovation and Industrial Development; Geography and the Creative Field Revisited,' *Small Business Economics*, **26**, 1-24.
- Sorenson, O. (2003), 'Social networks and industrial geography,' *Journal of Evolutionary Economics*, **13**, 513–527.
- Spencer, J. W (2008), 'The impact of multinational enterprise strategy on indigenous enterprises: Horizontal spillovers and crowding out in developing countries,' *The Academy of Management Review*, **33**, 341-361.
- Suarez, F. F. and R. Oliva (2005), 'Environmental change and organizational transformation,' *Industrial and Corporate Change*, **14**, 1017–1041.

Visser E-J. and de Langen P. (2006) The importance and quality of governance in the Chilean wine industry, *GeoJournal*, **65**, 177–197

Walters, A. (1999) Rebuilding Technologically Competitive Industries: Lessons from Chile's and Argentina's Wine Industry Restructuring, *Unpublished Ph.D. Thesis, MIT*