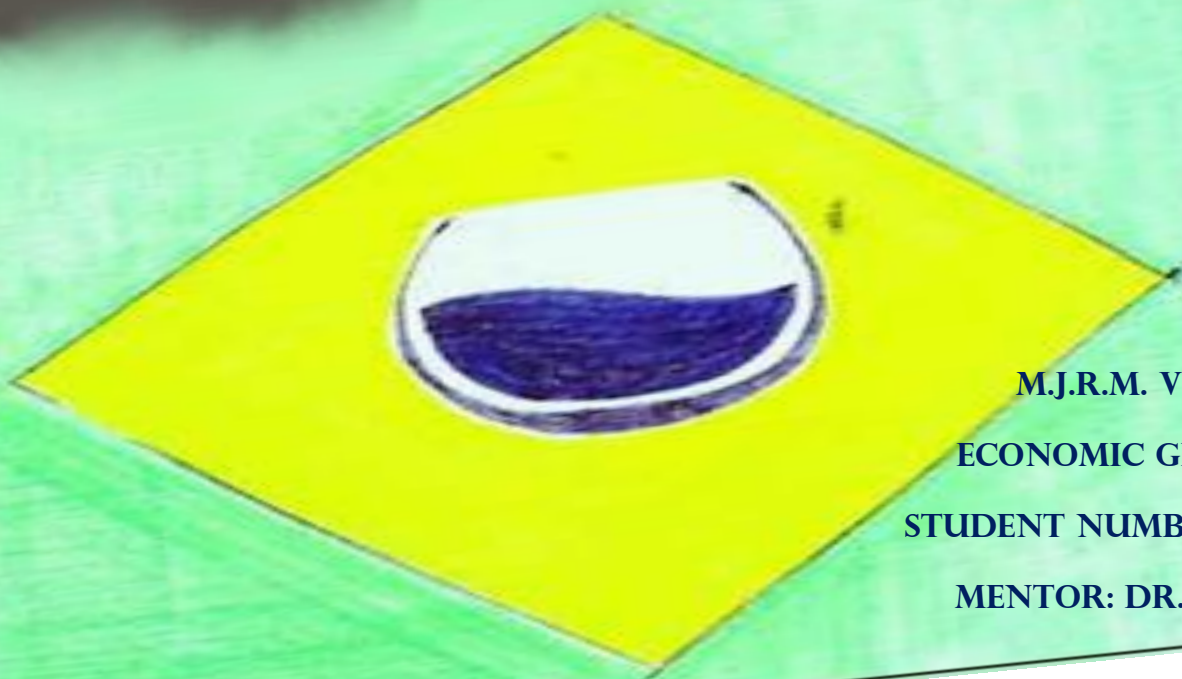


THE EVOLUTION OF THE BRAZILIAN WINE INDUSTRY



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PREFACE

This report presents the result of 10 months of research carried out at the University of Utrecht and the University Unisinos in São Leopoldo, Brazil. The author would like to thank Wouter Jacobs for his very helpful guidance during the process of this work and to Jorge Verschoore for facilitating research space in Unisinos and support in Brazil. Gratitude to Lee Pegler and Evert-Jan Visser for providing insights of the subject and location, based on their own experiences. Many thanks also go to Marcos Button and Eduardo Wilk for providing knowledge and contacts in the Serra Gaúcha wine cluster and cooperating in this research. Many thanks to Maristela Simon, Tatiana Back and Raiane Maria Andrade dos Santos of the secretary of Human Sciences of the University of Unisinos who helped me out greatly with setting out the survey and with all the logistical hassles of doing this fieldwork. Assistance in the fieldwork by lifting infrastructural problems and language barriers provided by Juliana Campos Chaves, Livia Padilha and Caroline Scotta de Oliveira is also appreciated very much. I am grateful for the financial support, provided by Kf Heinfonds. Finally, gratitude to everybody else for their support during this research.

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EXECUTIVE SUMMERY

Brazil is counted as one of the four fast growing economies that could be the most dominant economies by 2050. Together with Russia, India and China they form the BRIC countries that cover 25% of the world surface, have 40% of the world's population and have a shared GDP of 15.435 trillion dollars. Although Brazil's growth rates were not impressive in the last decade, it is booming at this moment. A remarkable growth of foreign direct investment from 10 billion US Dollars in 2005 to 45 billion in 2008, and the country is likely to be the fifth-largest economy in the decade after 2014. So in many ways one could say that Brazil is an upcoming economy and has great potential for further growth in the next decades. Especially in the agriculture Brazil has made a remarkable progress in the last ten years. The recent innovations in this industry have led to a miraculous increase of production. Embrapa is a governmental organization that had a large contribution in the successful implementation of innovations in agriculture in Brazil and is also very helpful in the Brazilian wine industry. This institution helps firms innovate and with their research centre, they work on solutions to solve several problems in the upgrading process of the industry and these firms individually. They do this by introducing new techniques of producing, bringing new machinery and diffuse knowledge. This is important for the upgrading processes in the Brazilian wine industry because Brazil does not have a long history of winemaking and is very recently trying to upgrade in several ways. Upgrading of the Brazilian wine industry is necessary to become a serious player in the global wine industry. The global wine industry is constantly changing and in order for Brazil to keep up, upgrading is the answer. Several factors can have influence on the upgrading processes of the wineries. ***The main research question is thus; which factors constrain and enable the process of upgrading the Brazilian wine cluster within global value chains?***

The research aim is ***to gain insights in the factors that constrain and enable the process of upgrading of the Brazilian wine cluster*** in order to analytically assess the evolution and performance of the cluster within global value chains and (inter)national markets.

The research is carried out by using different qualitative and quantitative research methods. First, a desktop research was made on relevant academic literature in the field of evolutionary economic geography and theories on *agglomeration economies, clusters and value chains*. These were used as a theoretical base of this research. Explorative interviews with several experts and representatives of wineries and wine importers in the Netherlands were useful for insights and preparation on the empirical part of the research. The empirical research involved a fieldwork of 4 months in the Serra Gaúcha region of Brazil. During this period, the author was embedded in the University of Unisinos and cooperated with another researcher of the university and with a representative of Embrapa. It became clear that foreign researchers cannot do research in English in this area, because a significant part of the population only speak Portuguese. Language barriers were solved by learning the language and the help of translators. In this fieldwork, twelve fully recorded and transcribed depth-interviews were conducted with representatives of wineries. In addition a survey was put out among 128 firms in the area. Thirty-nine have responded to the survey. The findings of the empirical part of the research were interpreted with the theory about evolutionary economics, and cluster and value chain theories. Additional literature was found in the period after the empirical part of the research, and used in this paper. By combining insights from different sources of information, the research strategy *triangulation* was used to increase the validation of the data through cross verification.

Three sub questions are made to answer the main research question, beginning with: *How do clusters evolve and what factors constrain and enable upgrading of firms in clusters?*

In order to answer this question it is best to begin with the explanation of clusters. They are described as geographical concentrations of firms involved in the same, similar, or related activities, which may, but do not need to, cooperate with one another. Clusters theories are derived from much older agglomeration economics that can be distinguished in three forms; *Increasing returns*, *location economies* and *urbanization economies*. Clusters can be seen as systems of interconnected firms and institutions that play an important role in competition. The cluster as a whole can create highly specialized skills and have a better survival in competition. Cooperation within the cluster is important to create benefits, but a network with actors outside the cluster is also important to avoid lock-in. These networks act like *global pipelines* that pump new knowledge and technology into the local cluster. Clusters are a part of a series of industries that are interconnected by the production process of a value chains.

The *value chain* describes the full range of activities that firms and workers do to bring a product from its conception to its end use and beyond. The integration of the world in this global age has led to the rise of global production systems on value chains using clusters across the globe. A global value chain can be defined as: *the full range of activities that take place in order to develop a product or service from beginning till end, through different stages of production on a global scale.*

This paper is written from an economic evolutionary geographic view with a focus on clusters, value chains and upgrading. *Evolutionary economic geography* uses concepts like; *path-dependency*, *lock-in*, *technological change*, *innovation* and the *spatial evolution of industries*. It is the geographical dimension of evolutionary economics. Evolutionary economics started as a countermovement of the neoclassic economy due to the dissatisfaction about the way this theory handled the change in technology. Were neoclassical economy assume *equilibrium*, *optimization* through *rational choice*, *a-historic*, *reversibility*, evolutionary economics assume *bounded rationality*, *irreversibility*, *heterogenic agents*.

It is argued that the term *upgrading* is described as '*making better products, making them more efficiently, or moving into more skilled activities.*' Four types of upgrading can be singled out.

- *Process upgrading*: the reorganizing of the production process by making it more efficient.
- *Product upgrading*: an improvement the products, or services that are produced by a firm.
- *Functional upgrading*: acquiring new, superior functions in the chain, or abandoning existing low-value added functions to focus on higher value added activities.
- *Intersectoral upgrading*: applying the competence acquired in a particular function to move into a new sector.

Upgrading of clusters can be influenced by several factors along the value chain. In this research these factors are divided into *upstream factors*, *downstream factors* and the *institutional framework*. The *upstream* factors are concentrated on the actions at the beginning of the value chain and are located in the producing countries. Factors are divided in (I) Proximity, (II) firm size & coordination, (III) knowledge base & innovation, and (IV) entrepreneurial drive. The *downstream* factors involve all

the activities that are carried out by global firms in developed countries such as retailing, trading and marketing. The factors on the downstream level are divided by (I) buyer-driven forms and (II) entry barriers. The *institutional framework* involves the laws and regulations that can infect upgrading processes and its factors are divided by (I) the policy framework, (II) trade-related constraints, and (III) structural drivers of industrial performance.

The cluster and value chain theories, and the different kinds of upgrading in an evolutionary economic geographic view will be discussed in chapter 2. It would be interesting to apply these theories to an industry in order to research the upgrading processes of this industry. This study will discuss the wine industry in chapter 3 answering the question: *How has the global wine-industry evolved and what are the factors affecting upgrading in the wine-industry*

The global wine industry is undergoing a significant transformation. The emerging of wines from the so called *New World* is causing a change in the supply side. The global wine market was originally dominated by several countries in Europe like France, Italy and Spain. These are seen as the traditional wine producing countries and are known as the *Old World*. Examples of *New World* wine producing countries are Australia, South Africa, Chili, Argentina, California (USA) and Brazil. First wine cultivation activities in these 'new' countries started from 1500. Explorers of the New World brought the knowledge and technology to these countries to produce wine. The production quantity and quality was low, but upgrading processes changed this and wine from these countries is now increasingly appreciated by consumers. They seem to prefer wine from the New World because of the uniqueness, innovative blending and quality what is a result of several upgrading processes. Some of these processes involved an intensive cooperation with research departments of organizations and universities. They provided in many cases a lot of knowledge and technology in the wine cluster as can be seen in California and Australia. Foreign knowledge is also popular to get access to knowledge, especially countries in South America make use of these foreign wine consultants that are called *flying winemakers* and are used as global pipelines to pump new knowledge in the wine clusters. These consultants are expert oenologists traveling around the world to advise local winemakers. Besides these factors of investment in knowledge and technology, firm size also is an important factor influencing upgrading. Upgrading can also be stimulated by the pressure from the demand side in a value chain. Especially retailers like supermarkets have large market power. They often control a big part of the demands in the global wine industry. Governmental subsidies and investments in technology and education also play an important role in the upgrading of these firms.

From the wine industry, this study will continue to narrow its focus down to the Brazilian wine cluster Serra Gaúcha, where the last sub-question can be answered: *How has the Brazilian wine cluster evolved over time and what factors enable or constrain upgrading?*

In Brazil, the first wine production was brought in by Italian immigrants who established their communities in the mountains of Serra Gaúcha in the state Rio Grande do Sul in 1875. Nowadays, 62% of the Brazilian wineries are located in this area with a production of 90% of the total Brazilian wine industry. Several institutions like Embrapa and Ibravin are present to assist in any upgrading processes of the industry. Embrapa is a research institution that provides knowledge and technology that wineries can implement in their production process. Ibravin is a marketing organization that is working on several projects to sell more Brazilian wine in the domestic and international wine

market. It is also responsible for a great deal of cooperation and coordination between several winemaking firms in the Serra Gaúcha region. In that sense it acts more as a leader firm than the large firms present in the cluster. One could easily speak of a wine cluster that is developing and wants to evolve. Many wineries are small family run businesses and some of them have no real intentions to upgrade. Other firms in the area are much larger and they are often the most willing and capable to invest in upgrading processes. Some of the wineries in 'Vale dos Vinhedos' are associated with a certain certification that indicates that the wine is from this valley and guarantees a certain amount of quality. Factors that were mentioned most often among respondents of interviews and survey that enable upgrading are; Keeping up with the changing market, The willingness to upgrade, The presence of Embrapa, Keeping up with the industry, and the access to technology. Most frequently mentioned constraining factors are; increasing competition in national markets, difficulty in accessing markets, lack of financial resources and the Brazilian tax climate.

The main conclusions are the following. In Brazil, several enabling and constraining factors have an influence on the upgrading processes on the Serra Gaúcha wine cluster. From academic literature of 2005 it became clear that in the Serra Gaúcha wine cluster *product & process upgrading* processes were present and *functional & intersectoral upgrading* processes were absent. The survey of this study (2010), shows the same figure about process and product upgrading. However, from the survey it also became clear that the firms claimed that they surely made efforts in functional upgrading in the last 5 years. In the question what activity they perform now that they did not do 5 years ago, *marketing activities* was mentioned most frequently. No intersectoral forms of upgrading were noticed in the work of Giuliani et al (2005) and none were found in this research of 2010. From the interviews it seemed that the presence of Embrapa, Ibravin and universities in the area have an important influence on the enabling factors of upgrading.

Hence, the presence of Embrapa and Ibravin are important factors that enable upgrading process of upgrading the Brazilian wine cluster within the global value chain. Embrapa is facilitating knowledge and research in the cluster and makes it available for all the wineries regardless of firm size or financial resources. Ibravin assists the wineries with marketing activities. It also supports the Brazilian wine industry to enter the global wine market and control the domestic market. It provides information about the changing market so the wineries can keep up with the wine industry. It also facilitates several meetings between the wineries what enhances the cooperation within the wine cluster and create more willingness to upgrade. Flying winemakers play an important role for large firms acting as global pipelines and pumping new, external knowledge in the wine cluster to prevent lock-in. Smaller firms benefit indirectly from this by imitating upgrading processes of the larger firms. The most important constraining factors are the tax climate of Brazil, lack of financial resources and difficulty in accessing markets. In a way these constraining factors are connected with each other. Because the Brazilian wine industry is relatively young, they have difficulty accessing markets, especially the international market. Because a lot of firms are young as well, they often lack financial resources. Moreover, the tax climate in Brazil makes it difficult to access the wine market, domestic as international, and does not assist in the financial problems a lot of firms face. Therefore, governmental financial assistance is needed to upgrade the Brazilian wine industry and enhance its competitiveness. This can be in the form of direct investments in technology or education, or subsidies for the wine industry by lowering taxes. This will remove a large part of the constraining factors.

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CHAPTER I

INTRODUCTION, RESEARCH AIM AND QUESTIONS

1.1 Introduction

In 2003 Jim O'Neill introduced in his paper for Goldman Sachs the term BRIC's and referred to the fast growing economies of Brazil, Russia, India and China (Goldman Sachs, 2009). He claimed that these economies would become the four most dominant economies in 2050. He claims that these countries will have a major impact on the world economy because of their size and economic growth. They cover 25% of the world's surface and 40% of the world's population and together they hold a GDP of 15.435 trillion dollars. When the BRIC countries were first announced as the future leading economies, some economists were somewhat skeptical about the first country in the BRIC term, Brazil (The Economist, 2009). Although the geographical size of Brazil is impressive (figure 1.1), its growth rate was not. Besides that, Brazil was seen as a country where there was constant political instability and had a reputation of squander its potential to grow (The Economist, 2009).

Although the criticisms back then were not unfounded, nowadays Brazil seems to be booming. Foreign investors today see Brazil as the country of the future for investments. From 2005 inflows of foreign direct investments made a remarkable growth from 10 billion US dollars in 2005 to 45 billion US dollars in 2008 and seem to keep on rising. Forecasts are that in the decade after 2014, Brazil is likely to become the fifth-largest economy, overtaking Britain and France. Some agree that Brazil outclasses the other BRIC countries on different levels. Unlike China, it is a democracy. Unlike India, it has no insurgents, no ethnic and religious conflicts nor hostile neighbors. And unlike Russia, it exports more than oil and arms, and treats foreign investors with respect (The Economist, 2009). So in many ways one could say that Brazil is an upcoming economy and for the next decades it has great potential for further growth.

Figure 1.1: Location and size of Brazil



Especially on the agriculture Brazil has made a remarkable progress in the last ten years. The recent innovations in this industry have led to a miraculous increase of production. This has transferred Brazil from a food importer to one of the largest exporters in agriculture (The Economist, 2010). Embrapa (Empresa Brasileira de Pesquisa Agropecuária) is the Brazilian Agricultural Research Corporation (figure 1.2), and it had a large contribution in the successful implementation of innovations in agriculture in Brazil. This institution helps firms innovate and with their research centre, they work on solutions to solve several problems in the upgrading process of the industry and these firms individually. They do this by introducing new techniques of producing, bringing new machinery and diffuse knowledge. They also help with improvement of production; with their expertise they hope to make firms become more efficient. Embrapa also has a great contribution in the upgrading of the Brazilian wine industry. A spokesman of Embrapa said: *'We try to enhance the quality of the wine that is produced by the wineries and also help them with other difficulties in production. These improvements are necessary for Brazil to become a serious producer and exporter of wine* (Interview, 14-04-2010).

Figure 1.2: Embrapa



Source: M. van Nierop & Embrapa, 2010

Originally Brazil was not a wine country at all. It started to produce wine because of the Italian immigrants from Veneto and Trentino that came to Brazil in 1875. These immigrants were stimulated by the Brazilian government to establish their communities in the thinly populated areas in the South of Brazil. Most of them settled in the Serra Gaúcha region (in the state of Rio Grande do Sul) and brought their peasant skills and their wine plants with them. From that time they began to produce wine in the region. Even today, the Italian influences are clearly visible. The names of the several vineyards reveal a lot about the Italian roots that lie here: Miolo, Don Guerino, Casa Valduga, Don Laurindo, Don Boscato, Lidio Carraro. For a long time the quality of the wine from Brazil was poor, it took about a century for the quality to rise above the average. There are two reasons for this; on the one hand because Brazilians were pretty uncritical about the wine, low quality wine was accepted and became the standard. On the other hand, Brazilians were a bigger fan of beer and sugarcane liqueur. In other words, the wine drinking culture was, and still is, not big in Brazil.

Today the Brazilian consumer is starting to drink wine, but there is strong competition for Brazilian wines from the more expensive, but more qualitative French wines and the cheap Argentine and Chilean wines. Although the competition is tough, changes for the Brazilian wine industry to dominate the domestic wine market seem to emerge. Just like the Brazilian economy is rising, the fortunes of the Brazilian wine sector is improving as well. Due to more promotion and tourism of the wine industry, Brazilians are getting familiar with drinking wine from their own country. Besides the growing domestic sales, interest groups on behalf of the Brazilian wine industry want to increase exports. There are eight countries where the promotion is focusing on for the next two years. Germany, Canada, United States, Hong Kong, the Netherlands, Poland, United Kingdom and Sweden are target for the increasing export of Brazilian Wines (Winesfrombrazil, 2009). With recent developments in education for winemakers and the in 1998 foundation of Ibravin, the covering Brazilian wine institute, responsible the promotion and marketing of the wine industry, there are several quality initiatives developed.

Almost the entire wine production takes place in the region where the Italian immigrants settled. Although 62% of the wineries are located in Rio Grande do Sul (Ibravin, 2010), 3.2 million hectoliter wine is produced in Serra Gaúcha every year. That is about 90% of the total Brazilian wine industry (Vargas, 2001). Most of the wine production is from small firms that are involved with a large cooperation. Just the wine cooperation Aurora alone has more than 1100 wine growers in its business. The overall growth of the Brazilian economy and the specific initiatives taken by the local wine industry raise questions about the extent to which the sector is able to innovate, upgrade and capture value added in both national markets and global exports. How has the wine cluster evolved over the last decades and what are the factors that shape its development path? How can the Brazilian wine cluster capture more value in the global chains of which it has become part?

From the theory, *clusters* are described as geographical concentrations of firms involved in the same, similar, or related activities, which may, but do not need to, cooperate with one another (Visser, 2006). In order to get certain benefits from this cluster, like knowledge spillovers and increased productivity, firms within this cluster need to cooperate. This way, a cluster can create highly specialized skills and have a better chance of survival in competition. To get optimal benefits, a cluster needs to be internally organized. Governance is needed to facilitate tacit knowledge transfers and capture value from agglomeration economics. This can be seen in the Chilean wine cluster, where governance is needed to deal with the coordination problems that investments and collective actions entail (Visser & de Langen, 2006). Apart from governance in cooperating at a horizontal level and facilitate the right institutions, cooperation with vertical complement industries are needed. Suppliers of grape stock, irrigation and harvesting equipment, barrels, and labels; specialized public relations and advertising firms (Porter, 2000) can be very useful in a wine cluster and can co-evolve with the wine industry.

But in order to avoid lock-in, they need to manage external relationships. Contacts within their global network are essential to stay innovative and the ability to react to changes in the market. *Networks* comprise strategic, purposeful, preferential, repetitive and cooperative interactions between business firms and other organizations, which may, but need not operate in close vicinity (Visser, 2006). These networks act as 'global pipelines' that pump new knowledge, capital, data, talent, and institutions into the local cluster. In the wine industry, Flying winemakers act as global pipelines for local wine clusters. They are expert oenologists who travel around the world and provide local wine makers with external knowledge (Lagendijk, 2004).

This paper will not only focus on the geographical cluster of the Brazilian wine industry, but will also reveal the evolutionary process what takes place in the several firms of the Brazilian wine sector in terms of upgrading. The outcome about the upgrading of the wine sector can also be important for the local economy. This knowledge can contribute to improvement in the production, can lead to an increase in wine exports and, most importantly, can provide insights on how local producers can capture value added. Apart from the social necessity to do research about this sector, there is little academic research on recent change in the Brazilian wine sector. Some articles about this subject need updating like Vargas (2001) and other literature like Fensterseifer (2007) cover a different angle of the research. This paper will reveal a different view about the Brazilian wine sector.

1.2 Research objective and Questions

The aim of this research is to gain insights in the factors that constrain and enable the process of upgrading of the Brazilian wine cluster in order to analytically assess the evolution and performance of the cluster within global value chains and (inter)national markets.

In order to gain such insights, we need to answer the following main research question:

Which factors constrain and enable the process of upgrading the Brazilian wine cluster within global value chains?

Clusters are described as geographical concentrations of firms involved in the same, similar, or related activities, which may, but do not need to, cooperate with one another (Visser, 2006). However, when firms do cooperate, they can learn from each other. Tacit knowledge can be translated into understandable knowledge and firms can benefit from this.

From Economic Evolutionary Geographic (EEG) theory and development studies it is argued that the term *upgrading* is often described as ‘making better products, making them more efficiently, or moving into more skilled activities’ (Giuliani, 2005). In the paper of Giuliani (2005) upgrading is defined as ‘innovating to increase value’. In this paper we use this definition as well because it fits in the EEG theory perfectly and is better measurable. Four types of upgrading can be singled out:

- *Process upgrading* is the reorganizing of the production process by making it more efficient. An example of process upgrading in the wine industry is an improvement in the technology to produce wine in order to save time and money.
- *Product upgrading* is an improvement the products, or services that are produced by a firm. The improvement of the wine quality is an example of product upgrading.
- *Functional upgrading* is acquiring new, superior functions in the chain, such as design or marketing or abandoning existing low-value added functions to focus on higher value added activities. Wine producers can upgrade from a production of general average wines to a specialization in a type of wine like sparkling wines for instance.
- *Intersectoral upgrading* is applying the competence acquired in a particular function to move into a new sector. Firms that originally only delivered grapes to a wine cooperation, can choose to produce their one wine. These firms will enter the wine sector and therefore upgrade themselves from a deliverer of grapes to a producer of wine.

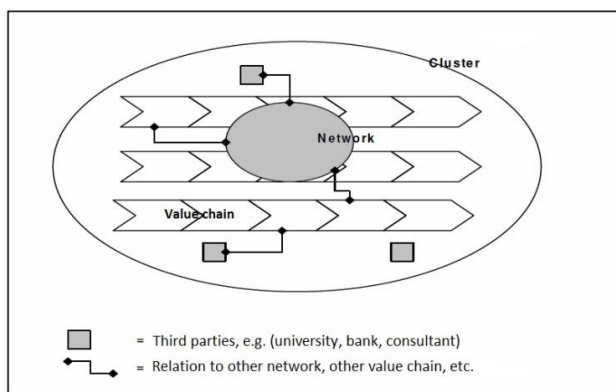
There are several *constraints and enabling factors* that can provide opportunities or treats to the upgrading of clusters. An example is the access to capital and resources; the more access to capital and resources there is, the easier it gets for a firm to upgrade inside a cluster or value chain. The same can be said about the knowledge base. A lack of this factor means that upgrading can be a difficult task for firms. Governance is particularly important for the generation, transfer and diffusion of knowledge leading to innovation, which enables firms to improve their performance (Humphrey & Schimtz, 2002). However, governance can also be used as a tool to constraint firms in upgrading; they can be bounded by certain rules that force them to produce in a certain way. Other factors can also play a constraining or enabling role in the upgrading of firms in clusters and that is why it is useful that in chapter 2 the following question will be answered: *How do clusters evolve and what factors constrain and enable upgrading of firms in clusters?*

The *value chain* describes the full range of activities that firms and workers do to bring a product from its conception to its end use and beyond (figure 1.2). This includes activities such as design, production, marketing, distribution and support to the final consumer. Rarely do individual companies alone undertake the full range of activities required to bring a product from conception to market. The design, production, and marketing of products involve a chain of activities that are often divided among different enterprises, often located in different places and sometimes even in different countries (Pietrobelli, 2007). The term *global value chain* emphasizes the fact that the value chain extents on a global scale. Several factors play a crucial role in global value chains, like value capture and creation, governance, and competition. These factors can play a significant role in the

horizontal (between firms) or vertical (between different activities) integration in this global value chain.

An industry is mostly involved in a value chain and, due to the globalization, it often takes place on a global scale. Several firms around the globe are connected from production of a commodity to eventually the consumer of the product. The wine industry is an example of an industry that has evolved for a long time and is involved in a global value chain. Some wines are produced and consumed in the same country but wines are often exported around the globe. If upgrading is applied to this industry, several factors will enable or constrain this. These factors will be described in chapter 3, answering the question: *How has the global wine-industry evolved and what are the factors affecting upgrading in the wine-industry?*

Figure 1.2: Complementarity of concepts: value chains, networks and clusters



Source: M. van Nierop; adapted from Nooteboom and Klein-Woolthuis 2002 in Visser, 2006

The wine industry in Brazil has changed a lot in the last 10 years; more quality wines are produced in order to enable the export of Brazilian wine. Plans to export on a larger scale are very recent and date from 2010. In order to accomplish this, firms of the Brazilian wine cluster Serra Gaúcha are improving their productions and products. It is also important to know if the firms inside the cluster cooperate and if they make use of networks and external linkages. This will enhance their chances of bigger domestic and international sales. So upgrading is an important issue in the Brazilian wine cluster and also on this scale, several factors can influence upgrading. Therefore, chapter four will answer the question: *How has the Brazilian wine cluster evolved over time and what factors enable or constrain upgrading?*

1.3 Methodology

This research started with a theoretical study. Academic articles and articles from magazines are used as secondary literature. Theoretical and empirical studies provided insights about the subject and were useful for the preparation of the empirical part of the research in Brazil. In addition, a Portuguese language course was taken to prevent any language barriers would disrupt the research.

A literature study on cluster and value chain theories, evolutionary economics and agglomerations economies was analyzed and studied to give insights on questions concerning this research and also used as an addition to the empirical findings of the research. The secondary literature was a useful source of information and provided clear insights on the wine industry and on several theories concerning the research.

This theoretical work has been checked with some open interviews and peer expert reviews in the Netherlands. Three wineries were interviewed. Two of them imported Brazilian wine and the third provided knowledge about the new wine world in comparison with the traditional old wine world. Several researchers who had experience with research about; cluster analysis, wine research and the country Brazil were also consulted to give a good idea about the subject.

The Brazilian part of the empirical study took place in the Serra Gaúcha region in a period of 4 months. Being embedded in the department of Human Sciences of the University of Unisinos (Universidade do Vale do Rio dos Sinos) and a cooperation with Eduardo Wilk of the department of Economics and Marcos Botton an agronomist and researcher of Embrapa (The Brazilian Agricultural Research Corporation) resulted in a good working atmosphere to conduct this research. Several visits to the Serra Gaúcha wine cluster and interviews with Ibravin and Embrapa led to a clear understanding of the region and gave insights of local factors and understanding of policy makers. It also became clear that in order for a foreign researcher to conduct research in this area, it is necessary to master the Portuguese language or to arrange a translator because of a significant part of the population do not speak English.

Twelve fully recorded and transcribed depth-interviews were conducted with representatives (mostly directors and export managers) of wineries in the period May 2010 – July 2010. An example of an interview can be found in appendix 1 and is written in English and Portuguese¹. Most of these interviews were conducted in Bento Gonçalves by the author who was occasionally assisted by research assistants from Unisinos. The interviews were semi-structured and lasted approximately 1 hour. The wineries were selected on several criteria such as firm size, international importance and ability to upgrade, in consultation with experts. The purpose of the interviews was to give insights about upgrading among the larger corporations and expose local networks and relations.

In addition a survey was put out among 128 firms. The total population of all wineries in Brazil is 1200, but many of them are not relevant for this research. In consultation with several experts from Unisinos, Embrapa and Ibravin, the firms were selected on the criterion whether the winery is producing fine wines. If so, the firm was included for the survey. The criteria for fine wines were considered as followed: Fine wine has a certain amount of quality that it improves with age. It represents a smaller amount of world wine production than the less qualitative and inexpensive bulk wines (Souza, 2001). A spokesman of Embrapa said: *'Wineries that do not produce fine wines are not interesting for this research because of the low amount of production, also little to no upgrading is present. Most of them can be considered as hobbyist. Therefore, wineries that only produce bulk wines do not really count as full-fledged professional wineries'* (Interview 14-04-2010). Of all the firms measured in Brazil, 579 wineries produce fine wines and most of them are located in the Serra Gaúcha region².

¹ Full transcript available on request.

² List of wineries is available on request.

Figure 1.3 shows an overview of the survey information. Due to a lack of available resources and the limited time during this research, it was not possible to reach all 579 fine wine producing wineries. Therefore a stratified sample of 128 firms was taken from the included population of 579 wineries in Brazil. The surveys were sent out by mail, using the Unisinos mail system. Thirty-nine firms have responded to the survey³. An example of a survey can be found in appendix 2 and is written in Portuguese. The purpose of the surveys was to explore what factors influence upgrading among the total population of professional wineries in Brazil.

Figure 1.3: Results of the survey among the Brazilian wineries

Total (N) in Brazil	Included (N)	n	Response	\bar{X} production of bottles per year	\bar{X} age	Main production	Mode Ownership	\bar{X} % own grapes
1200	579	128	39	879 709	20.6	Red wine	Independent	83%

Source: M. van Nierop, 2010

The last three months of this research has been used to interpret the empirical findings with the theory about evolutionary economics, and cluster and value chain theories. Additional literature was found in the period after the empirical part of the research, and used in this paper. Because of the relevance and the topicality it fitted perfect in this paper.

Several research methods were used to gather information in this study: A strategy was applied called triangulation. Triangulation is commonly referred to as the use of multiple methodological approaches in a research in order to increase the validity of the subsequent findings to answer the research question (Bryman, 2001). Specifically in this study, methodological triangulation was applied by combining insights from literature studies, conduction of a survey, taking interviews and making observations.

1.4 Structure of the thesis

This paper is divided in a theoretical part and an empirical part. After this introduction, chapter two sets out the theoretical part what will give insight about the recent literature written about evolutionary economics and similar studies about the upgrading of clusters in value chains. Factors that affect upgrading of clusters in value chains will be given in this chapter. They are generally described so that they can be applied to every industry. Chapter three will discuss wine industry in general; this will give insights in the global trends of this industry, and discuss the factors that enable and constrain upgrading of clusters in the wine industry. Chapter four will zoom into the Brazilian wine sector and will provide the empirical results of the paper. This will mainly be about the research that took take place in Brazil. The evolution of the Serra Gaúcha wine cluster will be described and the factors that influence upgrading of this cluster also be discussed. The last chapter is the conclusion. A reflection of the empirical results is displayed and compared with the existing literature. The main research question will be answered, and some policy recommendations are given.

³ Full transcript available on request

CHAPTER II

UPGRADING OF CLUSTERS IN VALUE CHAINS

2.1 Introduction

The increasing digitalization culture is creating a world where everybody is connected with each other, wherever they might be. Mobile internet and the increasing amount of network sites, is the most recent trend of globalization nowadays. Everybody seems to be connected in a more easily accessible network. In the economy this digitalization is also implemented, people are able, and sometimes expected to be reachable 24 hours a day, wherever they are. Some firms encourage the remote working of their staff for several reasons, for example to avoid traffic jams. This seems to have an impact on the ongoing debate about the importance of proximity between economic-geographers because the ease of reaching people in a network seems to decrease the importance of distance.

Thomas Friedman argues in his book 'The world is flat' (2005) that distance has no effect anymore on trade and the economy. Technology has shrunk the world into a tiny place and economic activities in a value chain are spread around the world, even activities of the one company can be performed by employees in other countries. Friedman brings examples of CAT scans done at U.S. hospitals that are examined by doctors in India and Australia, or helpdesks of American companies that are stationed in China and India. By outsourcing these activities the firm can gain more profit and with the current technology, distance is no issue anymore. Thus, what Friedman means is that the competitive playing field has leveled and that geography does not matter anymore in the performance of industries.

Partly true, the IT communication technology has brought us at a level that (global) communication is becoming easier every day. But it seems that the importance of distance is still underestimated. The *techno-globalism* approach underestimates the role played by geographical proximity in the transmission of tacit forms of knowledge and learning. One of the most important limits to globalization is the spatial mobility of knowledge (Vargas, 2001). Michael Porter (2000) argues that globalizations undergoes a paradox, on the one hand firms are outsourcing activities to low-wage countries in order to reduce costs, and on the other hand geographic concentrations of interconnected companies (clusters) are becoming more important in the competitive economy. The benefits that rise in microeconomics are crucial for the competitive advantage of the companies (Porter, 2000). Sure, the location where low skilled labor is carried out is not important, but knowledge and innovation are created in clusters. And innovation is one of the key drivers for economic growth (Stam, 2009). And therefore location and geographical distance still matters.

The importance of proximity could be seen a central subject in this chapter and will be explained in an evolutionary economic geographic theory. In this theory, clusters, value chains and upgrading are important factors. In order to get a clear understanding of the evolutionary economic geography, paragraph 2.2 will explain the basic views of this school of evolutionary learning. From this point of view, the chapter will continue with paragraph 2.3 about clusters and agglomerations. Here we will explain what clusters actually are and why they exist. Several theories about clusters and

agglomerations will pass the revue. This will help to understand why companies from the same or similar industries participate in a cluster, what the benefits and disadvantage are.

The focus of paragraph 2.4 lies on value chains. Firms do not only cooperate with firms from the same industry (horizontal) but also work with firms from other branches (vertical). Interaction with suppliers, buyers, institutions, research facilities and government are also part of a more complex whole, namely the value chain. A view on value chains is important to get insights how clusters take place in a global context.

Paragraph 2.5 will review the upgrading of cluster in value chains. There are different kinds of upgrading and the scale of upgrading can differ also. A firm can upgrade its activities, but this can have its effect on the cluster or even on the entire value chain. The last paragraph of this chapter is 2.6. It will focus on the constraining and enabling factors of upgrading. Several different factors can have an influence on upgrading. This paragraph will show these factors and explain why they could play a role in upgrading.

2.2 Evolutionary approaches in Economic Geography

In order to understand the evolutionary perspective of this study, it is essential to define the evolutionary economic geography. This chapter will give an explanation of the basic terms and make clear what they are based on. Evolutionary economic geography is based upon evolutionary economics, in which concepts like routines, competition, selection and innovations are central elements. This section will start by discussing the origin of evolutionary economics and give a basic understanding of these concepts. Secondly, paragraph 2.2.2 will narrow down to the spatial side of the evolutionary economy and focus on the economic geography with an evolutionary view. Three branches of evolutionary economic geography will then be discussed; these branches are path dependency & lock-in, the localization of innovation & technical chance, and the evolution of industries.

2.2.1 Evolutionary Economics

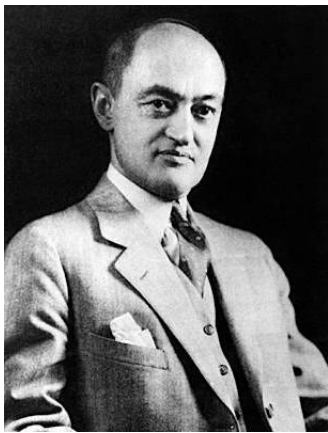
Evolutionary economics started as a countermovement of the neoclassic economy, due to the dissatisfaction about the way this theory handled the change in technology (Boschma et al., 2002). Neoclassic economy is the most important paradigm for economists in the micro economy. It is based on a free market where information is available for everyone, and the emphasis lies on equilibrium. The theory assumes an efficient optimum in the economy, in which it is in nobody's interest to change equilibrium. The neoclassic economy also explains that an individual is sovereign and has full rational knowledge of the market and acts to gain nuts maximization. Markets give crucial information about scarcity, because if the price becomes higher it automatically means that the product is more difficult to obtain.

The first counter-theories were developed by the Austrian economist Joseph Schumpeter (figure 2.1) in the early 20th century in his book *'The Theory of Economic Development'* (1911). Schumpeter assumes that deviant, innovative behavior can be disproportionately rewarded in the capitalist market economy. He defined innovation as 'new combinations of existing resources'. The equilibrium is continually disturbed by innovations and entrepreneurship. As entrepreneurship often involves innovation, new and innovative firms would be able to gain advantages towards other firms where innovation was absent. The term 'creative destruction' adequately depicts its views on this. New products or new ways of production can lead to the destruction of old products, old production

systems and industrial relations: “This process of Creative Destruction is the essential fact about capitalism.” (Schumpeter 1942, p.83 in Bosma et al., 2009)

Innovation leads to improvement of the economy. One of the most well known examples of creative destruction is the rise of the word processor for computers, which led to the fall of the typewriters. A second example is that with the rise of the DVD-player, the video recorder (VCR) industry was doomed to fail. Hence creative destruction means that in a capitalist economy, the creation of new products or processes will lead to the destruction of old products or processes. It also means that equilibrium in the economy is disrupted through constant innovation.

Figure 2.1: Joseph Schumpeter



It was not until 1982 that the ideas of Schumpeter and evolutionary economics got real attention with the work of Nelson and Winter. They published ‘An evolutionary Theory of Economic Change’ (1982), a book in which the most important features of evolutionary economics systematically were put out (Boschma et al., 2002). Their work explains aspects like firm routines, learning-by-doing and lock-in as central concepts to the evolutionary school of economics. Nelson and Winter add, unlike Schumpeter, a more theoretical perspective on firm behavior based on bounded rationality (Fagerberg, 2002). Bounded rationality means that firms will not act fully rational because of the lack of information and not having the ability to consider all possible solutions. The neoclassic economy ignores the fact that information is not freely available for everyone. Information or knowledge can be classified, or it can be obtained by coincidence. Hence, information and knowledge are limited available and not pro rata. Because of the differences in the availability of information, the evolutionary economy argues that a firm reacts suboptimal because of bounded rationality. Bounded rationality can lead to ‘satisfying behavior’, which means that actors will not change their behavior as long as it results in a satisfying outcome. If some form of dissatisfaction arises, the actor will search for alternatives, just as long until the outcome is to their satisfaction. Nelson and Winter argue that bounded rationality is the reason for the fact that firms trust on their routines to survive. These routines are certain rules that are unique for every firm and assist with decision-making moments whenever uncertainty is present. In this manner, they influence the behavior of the company and are a part of the organizational memory. Although routines cannot be seen as just the skills of individuals (Coe, 2010), they can be passed along in time through the skills of different employees. There are two ways to pass on these routines. The first one is through learning-by-doing: automatic behavior will be created by repeated practice. Employees can learn certain skills by repeatedly working in a specific manner. The second is through tacit knowledge: this form of knowledge is unique and can

only be applied within a certain context. Employees can share their tacit knowledge with other employees through face-to-face contact. The evolutionary economy distinguishes codified and tacit knowledge. Codified knowledge can be seen as information that easily can be understood by anyone and therefore easily imitated and transferred. Tacit knowledge is a form of information that is not easily transmittable, face-to-face contact is crucial in the communication to be understood properly. This highlights the importance of geography. Tacit knowledge is an important factor for innovation and upgrading, and is not very suitable to travel a large distance (Hall & Jacobs, 2010).

These routines can support decision making in uncertain situations, but it can also lead to lock-in. When there is no creation of variety, a firm can lose grip on the changing market. Firms that only carry out their routines and are not open for change, can be locked-in their own routines. Chance is that they will lose their market share. Nelson and Winter argue that innovation is essential for survival in a changing (evolutionary) economy, because innovation creates variety (Fagerberg, 2002).

Arthur (1994) argues that if there are increasing returns involved, bounded rationality in the economy leads to uncertain outcomes of the success of products. The success of a product is dependent on a variety of factors. When one product is eventually successful, it can become irreversible to other, even better products. This is because of the increasing returns resulting from R&D (research and development) investments, learning by doing and network externalities (Fagerberg, 2002). If the product is diffused on a large scale and people learn how to use this product, it is very hard to introduce a product that will replace the old one. A clear example in this case is the existence of the QWERTY-keyboard (figure 2.2). Once designed for the typewriter, the letters were placed in a certain order to prevent the typewriter to jam while typing. This specific model became the standard for any typewriter and this type of keyboard began to diffuse around the world. Anybody who started typing learned it on this specific model. With the introduction of the computer, the QWERTY-keyboard model was not necessary anymore for the jamming of the machine. Other, more efficient models were available that provided a faster way to type. But because this model became such an advanced standard in keyboards design, changing it for something else would be inefficient. Therefore the product is locked-in and unavailable for change.

Figure 2.2: Qwerty-keyboard on a typewriter



Thus, where the neoclassic economy assumes a balanced economy, the evolutionary economics emphasizes on changes in the competitive market whereby an agent is understood as heterogenic and constrained by bounded rationality. History is important in the determination of the formation of the agent. It depends how and where someone starts and works from this point on. A son from a farmer born in the Midwest of the United States of America has a bigger chance to become active in the agriculture than a son from a lawyer born in New York City. The evolutionary economy calls this

path dependency. Path dependency means that happenings in the past always have influence on happenings in the future. Irreversibility is related to this theory, because history has a large impact on it. This means that for example a firm is active for years in the IT industry, invested a lot of money and time, and obtained a lot of knowledge of this business. This firm cannot suddenly decide to become active in the pharmacy industry, just because profits are higher in there. With his specialty, the firm is pretty rusted in his own industry and lacks the experience and knowledge to survive in the pharmacy industry. However, it has to be clear that this effect has a different impact on different industries. The effect is less apparent in starting industries or firms.

In general it can be said of irreversibility that; even when in a certain time it becomes clear that an alternative variant is better, it is not likely that it will lead to a change in technological development. Especially because of the switching costs that will come with a change in technology (Boschma, 2002).

Path dependency and irreversibility are often related to space. When specialized firms are located in a certain region they are place dependent. It is not only the history and the path of the individual firm that matters, but the path and history of the entire region. This has the biggest effect on old industrial regions where changing the path is the hardest. As Boschma and Lambooy (1999) put it: old industrial regions are closely oriented towards established industries, due to strong commitments of capital goods, management, R&D (Research & Development) and labor to traditional technologies. This makes them less fit to diversify into new activities. (Hall & Jacobs, 2010, pp. 4). This highlights the importance of the geographical dimension in evolutionary economics.

2.2.2 Evolutionary Economic Geography

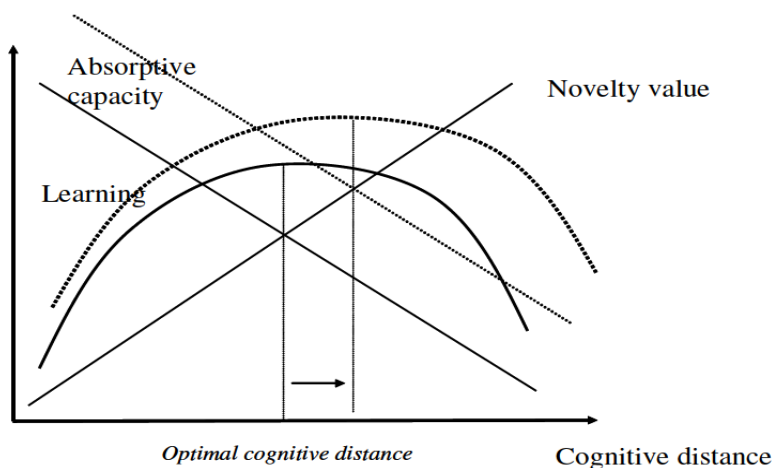
This brings us to the geographic dimension in evolutionary economics. Having explained the basic terms of evolutionary economics and the main elements they are based on, it can now be reflected in a spatial context. Coe (2010) divides the evolutionary economic geography in three branches.

The first branch tries to mobilize the evolutionary concepts of *path dependence* and *lock-in* in a geographic context. He argues that these concepts are related to the regional economy. As explained above, the path dependency of a firm is locally emerged in the region where it is operational. Other firms and actors have influence on the behavior of the firm and therefore the path dependency of a firm is to a large extent place dependent (Coe, 2010). Hence, the region is decisive for the path that a firm will take. An industrial region can become highly specialized because of the presence of several firms from the same industry. But a risk will arise when firms become rusted in their industry. The region will become locked-in.

The second branch aims at explaining the localization of *innovation* and *technological change*. The technological innovation of firms is localized because they are embedded in a specialized cluster or local economy. It is important to have variety within a cluster to prevent lock-in and incite innovation. The variety should be broad enough to create new insights and avoid cognitive lock-in, but narrow enough to be understandable. An optimal cognitive distance (figure 2.3) is essential because cognitive proximity provides good communication, but too much will lead to minimal learning and innovation. On the other hand, too much cognitive distance will lead to large differences and the firms are not able to communicate (Boschma, 2005). Cooperation between a Chinese biologist and an Italian lawyer is very innovative but they have no interfaces to learn from each other or the ability to communicate. But if two scientists from the same university, same

faculty, same age and same point of view work together, the chance that they will produce something new is small. An example of an optimal cognitive distance is the cooperation between 'Phillips' and 'Douwe Egberts', who came with a new kind of coffee machine that was revolutionary in both industries. Phillips made new coffee machines, called Senseo. Douwe Egberts started to sell new kind of coffee product; the coffee pad. According to Boschma (2005) there are other proximities worth mentioning. Apart from geographical and cognitive proximity, he distinguishes three other forms; organizational, social and institutional. An optimal distance of these proximities can be crucial for the understanding and relevance of new knowledge.

Figure 2.3: Optimal cognitive distance



Source: Nootboom, 1999

The third area of evolutionary economics according to Coe is the *spatial evolution of industries*. It will help to understand how industries emerge and develop in spatial terms (Coe, 2010). The location of firms during firm entry, exit and spinoff can display spatial changes of an industry. Studies have shown that spinoffs tend to locate near its parent firm and have a bigger chance of survival than other startups (Stam, 2007). The amount of innovation that spinoffs create also indicates that these areas are set to be more successful clusters. An example of this spatial evolution is Silicon Valley, this cluster has proved to be innovative and provider of several spinoffs. Regions that do not provide a lot of spinoffs and have more firm exit, have a bigger chance of producing less innovation and with that a bigger chance of failure. The German Ruhr area is an example of a industrial cluster that was successful in the past but declined in a not innovating, rusted industry that does not produce spinoffs. The firms in the Ruhr area are expected not to adjust to the changing market, while firms in the Silicon Valley area have a bigger chance on success. Hence, the evolution of firms in certain areas is therefore place dependent.

According to Martin & Sunley (2003), highly specialized areas are more risky in changing markets. These *localization economies* (Porter, 1990) are more susceptible to external shocks. They argue that firms would become less place dependent with more variety in a cluster, what can be found in urban economies (Jacobs, 1969). This would increase the chance of conversion of a cluster and, eventually, the survival of firms. Agglomeration theories like these are explained in paragraph 2.3.

2.3 Clusters and Agglomerations

The previous paragraph was aimed to explain the evolutionary economic geography which emphasized the importance of innovations and learning. Both are facilitated by spatial proximity. These ideas have formed the core of cluster theories and much older perceptions on agglomeration economics dating back to Marshall (1879). In this section we will discuss some agglomeration theories that indicate some benefits that occur when firms are geographically concentrated. The following paragraph will show the benefits and disadvantages of clusters. Here it is demonstrated how firms must behave inside a cluster in order to obtain the optimal result and to become aware of the dangers.

2.3.1 Agglomeration Economics

Several empirical studies have shown that location affects economic activity (Feldman, 1999). Firms often tend to locate their establishment in concentrated areas. The benefits that these agglomerations can provide are usually higher than the negative consequences. The economist Alfred Marshall argued that the external economies were important for the location choice of a firm. He developed three reasons for localization. First, a concentrated industrial area creates a pool of skilled employees. Finding new employees would be easier in times of a tight labor market. Second, it can support the production of non-tradable specialized inputs. Third, concentrated areas can create knowledge spillovers (Krugman, 1991). These spillovers create variation, what can lead to innovation. The agglomeration theory can be distinguished in three forms:

- Increasing returns
- Location economies
- Urbanization economies

Increasing returns are generated when cost reduction is realized through economies of scale. Krugman (1991) argues that inside concentrated areas, direct and indirect interaction between firms can arise. When such interaction produces positive externalities for firms, increasing returns are created (Karlsson, 2005). Firms can reduce transaction costs inside a cluster by the reduction of travel and transport costs. This stimulates cluster formation (Karlsson, 2005). Firms can also share similar activities, like the purchase of certain products what can lead to cost reduction. The costs of products per unit will be reduced through operational effectiveness, and with that increase production.

Localization externalities arise when a firm locates in a concentrated area of the same or related industry. Knowledge spillovers that are external to firms but internal to an industry within a geographic region are defined as Marshall-Arrow-Romer externalities (MAR) (Feldman, 1999). Central in the MAR-perspective is the prediction that local monopoly has a more positive effect for growth than local competition as it allows the externalities to be entirely internalized by the innovator (Jacobs, 2009. p. 10). Innovation may be stimulated if the increasing returns to scale are present. This could be activities that create higher specialization in both input and output markets, increase productivity or lower the costs of supplies to the firm (Feldman, 1999). With the increase of the number of firms in such a region, the unit costs of each firm inside the region will decrease (Karlsson, 2005).

Urbanization economies arise when firms locate in urban areas, like cities. They are external to industries but internal to cities and the scale effects depend on the size and density of these cities (Feldman, 1999). The firms in these urban areas form a complex or an integrated economic setting of localized firms within many different industries (Karlsson, 2005). The advantage of an urban area is that the pool of workers and the knowledge flows are present in large concentration and are very varied. However, diseconomies sometimes occur when the urban area suffers from congestion and high land prices and office rents.

Porter (2001) and Jacobs (1969) claim, unlike MAR, that innovation and growth is the highest in a competitive atmosphere instead of a monopoly. Porter and Jacobs differ in their opinion whether competition in either similar or different industries is best. Jacobs argues that the advantage of urban areas is the variety of different industry in a region. Firms from different industries complement each other from different views. Most important knowledge transfers come from other industries (Jacobs, 2009). Porter however, claims that the benefits will rise if firms are concentrated within the same industry. Highly specialized clusters will appear where innovation and growth are inevitable.

2.3.2 The Rise of the Cluster-concept

The localization economy theory argues that firms tend to concentrate within a geographical area with other firms of similar or related activities and that this concentration can be seen as a cluster. Porter (2000) defines clusters as geographic concentrations of interconnected companies and associated institutions. The interconnected companies consist of firms from the core industry, specialized suppliers, service providers and firms in related industries. Associated institutions are universities, standard agencies and trade associations (Porter, 2000). Porter argues that inside a cluster a competitive atmosphere between the firms of similar industries will occur. This will lead to innovative behavior and will improve the entire region in its competitiveness. Industries of related activities can also be found inside clusters. By the economies of scale created inside a cluster, the purchase of stocks can be high. Suppliers of these stocks can profit from this demand and are well located close to the buyer.

Firms do not always cooperate in a cluster, but to gain the most benefits, cooperation within the cluster is desirable. Benefits such as knowledge spillovers, increase in productivity, spin-offs, sharing of tacit knowledge, can arise from a cluster and create an innovative environment where firms have a chance to learn from each other. Evidence has shown that small firms overcome various constraints, e.g.; lack of specialized skills, difficult access to technology, inputs, markets, information, credit, and external services, better in a cluster than outside a cluster (Giuliani, Piattobelli & Rabellotti, 2005). The cluster as a whole can create highly specialized skills and have a better survival in competition. In other words, clusters can be seen as systems of interconnected firms and institutions that play an important role in competition (Porter, 2000). For companies it is important that they have highly educated and capable employees working for them. In a cluster they will find more easily a pool of skilled workers to choose from. Employees will meet employees of other firms in business and social meetings, which is also beneficial to a firm since it gives them a better image of their competitors.

In spite of the benefits, clustering can have some negative effects. When the cluster is located in an urbanized area, or when the cluster appeals to many institutions, the space in a cluster can be limited. This will cause a rise in the land prices and office rents. As result it becomes more expensive

for the employees to live near the firm so they expect a higher income. Sometimes the firms inside a cluster set barriers to entry. This will make it more difficult to enter a cluster, especially for smaller companies. The reason to set a barrier is to maintain a certain quality and leave out competition; disadvantage is that the cluster can rust and the firms will become cumbersome old firms.

Maybe just as important as cooperation inside a cluster, is a view outside. Contact with firms outside the cluster to avoid *lock-in*. Lock-in can, like routines, be seen as a limitation in adaptability and is one of the most negative elements in a cluster. Firms can be conservative and risk-averse (Boschma, 2002). The risk of lock-in in a cluster means that firms only have a view on themselves and other companies in the cluster. Firms compete and imitate each other, while innovation is passed by. This lack of adaptability to the rest of the industry can lead to the failure of the entire cluster. That is why contact or cooperation with other companies or organizations outside the cluster is crucial. These contacts outside the cluster are called *global pipelines*. These global pipelines keep the eyes of the firms open for any changes in the market and contribute to renewal/innovation inside the cluster.

Although the cluster concept seems suitable as an analytical concept to explain firm competitiveness, behavior and interaction, some authors are critical about these theories. Martin and Sunley (2003), claim that the cluster concept is seductive, but warning is needed in the applicability because of all the problems that can arise. They argue that cluster ideas are used too quickly and pass many fundamental conceptual, theoretical and empirical questions. Where a model or theory is repeatedly tested and considered before put to use, the cluster theory became largely accepted and seen as a valid way to explain competitiveness and innovation. However, there seems to be no clear evidence that firms in concentrated areas did not had a higher rate of innovation or adopted new technologies faster than other firms in a more scattered area. Clusters can be seen as a trend that can disappear as fast as it became popular. Although, with the repeatedly and automatic use of these theories by policy-makers, the theory can remain popular and therefore in use, without any good reason for it (Martin & Sunley, 2003).

Their main critique is aimed at the cluster ideas of Porter. They claim that the empirical and analytical significance of the cluster concept is weakened by the fact that cluster definitions lack clear industrial and geographical boundaries. The way this concept is used stretches the limits of credulity and assumes that 'cluster processes' are scale independent. The vague typologies of cluster types and evolutionary paths are one of the reasons for the lack of geographical precision and consensus (Martin & Sunley, 2003). Assuming to Porter, all types of clusters fit in his theory, although clusters in reality vary in type, origin, structure, organization, dynamics and development trajectory. Krugman (1994, 1996) and Turner (2001) criticize Porter on the fact that nations, regions do not compete with each other the way firms do. Porter mixes the terms *competitive advantage*, *competition* and *productivity*. They also argue that firms and nations are not comparable (Martin & Sunley, 2003).

Another point of critique is the *social embeddedness* of Porters clusters concept. According to Porter, social networks and social capital are crucial for successful upgrading and functioning of clusters because of the link between localization and tacit knowledge. Martin & Sunley claim that this is under theorized in his model, and for many it is not precisely clear what it is or how it acts as a source of competitive advantage.

In order to reduce the amount of confusion of the cluster concept, Gordon and McCann (2000) distinguish three main cluster models (Karlsson et al, 2005):

- The classic model of pure agglomeration; they refer to service economies of scale and scope and to job-matching opportunities.
- The industrial-complex model, referred to purchases between firms and explicit links of sales.
- The network or club model, referring to as the social-network model, which focuses on social ties and trust.

Although this separation of different types of clusters is helpful, Martin & Sunley (2003) still see problems and they advise local and regional authorities to focus on the encouragement of the business environment of all firms and their productivity improvements. Any cluster theory that is helpful should be able to show how different types of clusters are likely to develop within the evolution and dynamics of a changing industry and innovation. The clear method to determine the geographical boundaries of clusters would help with the identification of clusters and is therefore also needed in a good cluster theory (Martin & Sunley, 2003). In this way, clusters would be more convincing.

In order to start and maintain good cooperation in a cluster, governance is needed to coordinate the relations within the cluster. Governance must look beyond the horizontal view within a cluster, and expand its view vertical and diagonal to create a good position for the firms in the value chain. These external links are crucial for a cluster to avoid lock-in and maintain global connections. They can act like *global pipelines* and provide new knowledge and technology for a cluster (Balthelt, 2004). The diffusion of this type of knowledge inside the cluster is called *local buzz*, which is necessary keep to the balance between the local and global connection (Balthelt, 2004).

2.4 Global Value Chains

The latter insights have become more important in this global age, in which world trade has become more integrated, whereas production has become more disintegrated. This new spatial division has led to the rise of global production systems on value chains using clusters across the globe. Production does not occur locally or regional anymore but is spread internationally. This is seen as a breakdown in the 'Fordist' or vertically-integrated way of production and amplified by trade liberalization and falling transportation costs (Feenstra, 1998). In order to produce efficiently and reduce costs, outsourcing on a global scale seems the best option. The global disintegration of production emphasizes the importance of global value chains and outsourcing.

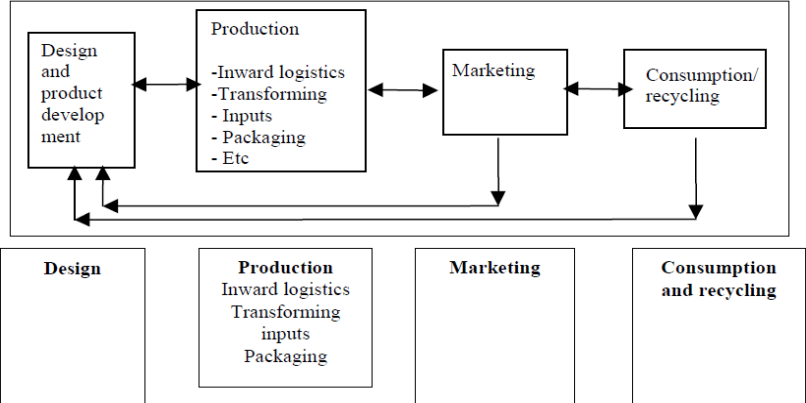
Critics claim that by outsourcing several production processes to industries all around the globe, the national economy will suffer from the loss of these jobs. However these critics do not calculate the benefits a firm can achieve by this outsourcing and, eventually, improve the national economy even more. With an efficient disintegration of the production, cost reduction can be realized. The price of a product will drop, which means that merchandise trade can grow. The producers that are suppliers of all different materials earn a relative small part of the total amount that is made by the product. Most value is added through marketing, advertising, wholesaling, retailing and design (Feenstra, 1998). Production often takes place where labor and materials are cheap, the design (begin of the chain) and retailing (end of the chain) are made by multinationals. They are the most important firm

in the chain and are known as *leader firms*. Due to their size, market position and knowledge, leader firms have the ability to do investments were other firms in the cluster can benefit from. They are also likely to play a dominant role in the coordination and governance of the global value chain (Gereffi, 2005). The firms in developing countries that want to access global markets are dependent on participation in global value chains led by firms based in developed countries (Gereffi, 2005).

In order to understand a Global Value Chain, a clear definition can get rid of any ambiguities that may arise. A global value chain can be defined as: *the full range of activities that take place in order to develop a product or service from beginning till end, through different stages of production on a global scale* (Kaplinsky, 2000). In these different phases value is added in each link that will pass the production line. The height of the value added can differ greatly in the different phases. Usually the most value is created at the end of the chain.

Although often (as in figure 2.4) the lifeline of a product moves from left to right through the different stages of production, they can be seen as *vertical* in the value chain. From the bottom-up, a basic explanation of the value chain usually starts with firms that are engaged with design and product development. They pass the product on to the next firm in line that will focus on the production and add value to it. Another firm will deal with the marketing and handles the distribution. And finally the product will reach its consumers. This is a very simple reproduction of the lifeline of a product in the vertical dimension of a value chain. In real life, much more firms are part of a value chain and different kinds of value added activities can be seen. Figure 2.4 displays a standardized of a value chain.

Figure 2.4: Four links in a simple value chain



Source: Kaplinsky & Morris, 2001

Another complex element in the value chain is the *horizontal* dimension, i.e. the firms in the core industry. These are organizations of the same industry, sometimes located in a cluster, that compete and cooperate with each other, and are one link in the vertical dimension. In this cluster, as mentioned before, other industries that are further upstream or more downstream in the value chain can also be indicated. In some way they are involved in the production process and are located in the cluster to gain certain advantages. Some of these industries are also involved in a diagonal form. They are sometimes, but not necessarily located in the cluster.

The *diagonal* dimension of the value chain covers industries that are not directly involved in the production process, but are necessary to carry out the process. Banks or private investors can be crucial to deal with financial issues. Furthermore, research facilities like universities have an indirect influence on the products, by providing knowledge that can lead to innovation of the product or the production process. The government can also be in contact with the value chain by the regulations they draw and the taxes they impose on them. There are also industries that profit from the success or popularity of the firms in a cluster. The tourism and food industry are examples of industries that can profit of the popularity of a cluster (Porter, 2003). They don't have influence on the product itself, but can be important for the promotion of the product.

2.5 Upgrading of Clusters in Value Chains/Global networks

In previous paragraphs it has been shown that clusters contribute to the cooperation between firms and how this affects the level of innovation within these firms. It is also been shown that value chains play a significant role in the clusters, because local clusters can be seen as a part of a global value chain. The cluster (2.3) and the value chain (2.4) are both widely discussed separately, but this paragraph will emphasize the upgrading of clusters in a value chain. Upgrading is regarded as the capacity to change their routines (innovate or imitate), and with that obtain more value added in their products and processes (Humphrey & Schmitz, 2002). Because of the concepts of upgrading and the evolutionary economic geography are overlapping, you can say that they are related. In this case, the upgrading of firms in a cluster also increases and improves their participation in the global economy.

Literature is often primarily focused on local competitiveness and ignores the external linkages (Giuliani, Piettrobelli & Rabellotti, 2005). As has been demonstrated, competitiveness leads to efficient and innovative behavior. That is a form of upgrading. Upgrading goes beyond the local dynamics and can be seen in all aspects of the value chain. This means that the upgrading can be carried out on a global scale. Upgrading is shifting from lower- to higher-value economic activities within global commodity chains by using local innovation capacities to make continuous improvements in processes, products, and functions (McDermott, 2005; Doner, Ritchie, and Slater 2005; Giuliani et al. 2005).

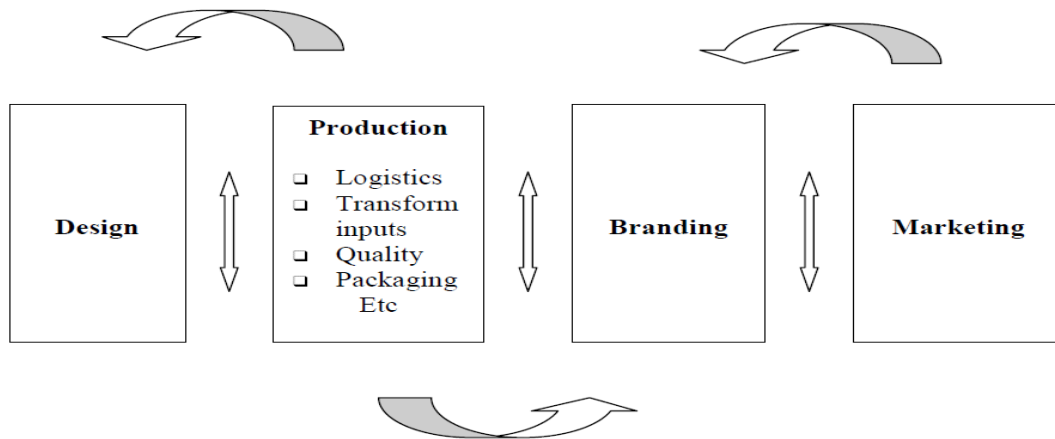
In the Global Value Chain (GVC) framework, upgrading is linked to a combination of making better products, improving processes to make these products, and/or taking over new functions (Ponte & Ewert, 2009). This combination of improvement can be divided into three types of upgrading; process, product and functional upgrading. To this, a fourth type is added which is called chain upgrading. In the next section this forms of upgrading is described.

Process upgrading is an improvement in the efficiency of production. A reorganization of the production process can lead to time or cost reduction. The introduction of new or improved technology can also lead to a more efficient way of production and can therefore also be counted as a form of process upgrading. An example of process upgrading is the implementation of computerized robots in the production of automobiles. The accuracy, speed and efficiency increased and the costs per unit reduced at the same time.

Product upgrading is an improvement of the products, or the introduction of a new product that a firm produces. If the firm provides services, the product upgrading is an improvement in the services or the introduction of a new service. An example is the introduction of the hybrid car, an improved version of the automobile that is less harmful for the environment. The introduction of this type of car can be seen as a form of product upgrading.

Functional upgrading is the creation of more value added by changing the amount of activities within and between links in a value chain (Kaplinsky & Morris, 2001). A firm can acquire new or superior functions in the chain or decide to abandon existing low-value added functions. An example of functional upgrading is when a firm starts to implement the marketing of its product in its activities if this will lead to more value added. Outsourcing can also be a form of functional upgrading, firms can outsource their accountancy, when it is considered as a low value adding function. This can be an efficient move to reduce costs. In figure 2.5 we can see the shifting of activities between firms what leads to functional upgrading.

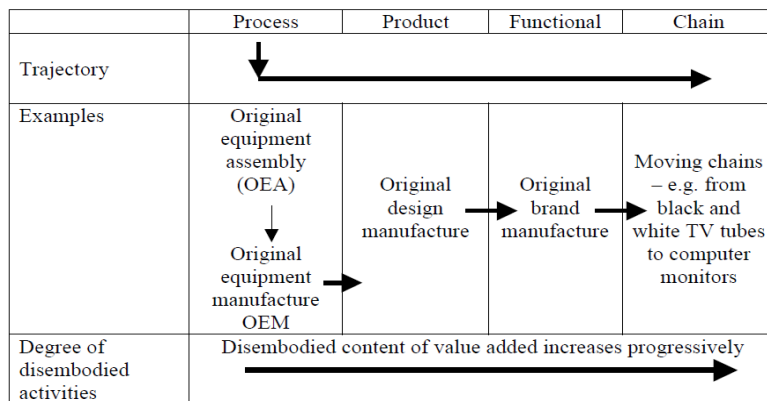
Figure 2.5: Functional upgrading in a value chain



Source: Kaplinsky & Morris, 2001

If these types of upgrading are put in order of hierarchy (figure 2.6), the fourth type of upgrading can be seen as the highest form. This type is called *intersectoral* or *chain upgrading*, the application of the competence acquired in a particular function to move into a new sector or value chain. In other words, this means that a firm can enter other sectors or value chains by producing new products. A good example to clarify this type is the Taiwanese firms. They started with the production of simple products like calculators and radio's, then they evolved into television producers, subsequently focusing on computer monitors, the production of laptops and are currently active in the industry of smart phones (Kaplinsky & Morris, 2001).

Figure 2.6: Hierarchy in the upgrading.



Source: Kaplinsky & Morris, 2001

In order to achieve upgrading in a value chain, collective efficiency is needed. But chain leaders also have a significant impact on the amount of upgrading in a value chain. The level of governance in a value chain is also of influence on the success of this upgrading (Giuliani, Piettrobelli & Rabellotti, 2005). These chain leaders can act as a catalyst for the innovation and upgrading within a cluster. These are usually bigger firms who have the ability to invest in R&D and have a financial buffer to take a certain risk of failure. Other firms often tend to follow these *leader firms*, either by cooperation or imitation. These leader firms contribute to the knowledge transfer in a value chain, suppliers and other firms upgrade their skills through these firms (Ernst & Kim, 2002). Apple and Nike are examples of leader firms; they dominate networks. With this market power they can force suppliers in certain production techniques. If they do not, the leader firms will search just as easy for other suppliers. So leader firms have the ability to break the value chain down into parts and decide where and by whom these functions are being carried out (Ernst & Kim, 2002)

Apart from upgrading, governance also play an important role in the upgrading process, the term governance is used to point out the coordination of economic activities through non-market relations. Both cluster and value chain approaches underline the important effect of upgrading (Humphrey & Smitz, 2002). As figure 2.7 shows, cluster literature emphasizes on incremental upgrading and the importance of local governance that is characterized by close inter-firm cooperation and active private and public institutions (Humphrey & Smitz, 2002). Interactions within the cluster could promote collective efficiency. For value chain theories, local governance is not discussed. Strong governance is only present within the value chain in external relations and because value chains are often boundless to borders, the coordination is increasingly managed through inter-firm networks. By allocating new task by the value chain's leader firm and through learning by doing, incremental upgrading is made possible. The competitive challenge of the value chain is to develop linkages with major customers and gaining access to chains.

Figure 2.7: Governance and upgrading: clusters vs. value chains

	Clusters	Value chains
Governance within the locality	Strong local governance characterized by close inter-firm cooperation and active private and public institutions	Not discussed; local inter-firm co-operation and government policy largely ignored
Relations with the external world	External relations not theorized, or assumed to be based on arm's length market transactions	Strong governance within the chain; international trade increasingly managed through inter-firm networks
Upgrading	Emphasis on incremental upgrading (learning by doing) and the spread of innovations through interactions within the cluster; for major upgrading initiatives, local innovation centres play an important role	Incremental upgrading made possible through learning by doing and the allocation of new tasks by the chain's lead firm; discontinuous upgrading made possible by 'organizational succession' allowing entry into more complex value chains
Key competitive challenge	Promoting collective efficiency through interactions within the cluster	Gaining access to chains and developing linkages with major customers

Source: Humphrey & Schmitz, 2002

2.6 Factors influencing Upgrading: A systemic approach

Upgrading of clusters can be influenced by several factors along the value chain, from begin till end. In order to give a clear understanding of these factors, the value chain can be divided in *downstream* and *upstream* factors. The *downstream* factors involve all the activities that are carried out by global firms in developed countries such as retailing, trading and marketing. The *upstream* factors are concentrated on the actions at the beginning of the value chain and are located in the producing countries. Extractions and basis processing are activities that can be associated with upstream activities (Farfan, 2005). In addition to the downstream and upstream factors, the *institutional framework* can also have influence on the upgrading abilities of a cluster. The institutional framework involves the laws and regulations that can be applied in both the upstream and the downstream part of the value chain. Some institutional factors affect producing countries, others affect consumption countries, and some others affect both countries. And if the commodity is not exported, both upstream and downstream factors are in the same country. So to prevent a certain amount of overlap, these institutional factors are taken apart from the upstream and downstream factors and put in a new section.

In this final section of chapter 2 the factors that have influence on upgrading will be discussed according to the sectoral approach. They are divided into three sets of factors: *upstream factors*, *downstream factors* and the *institutional framework*. These factors can have a positive as a negative effect on upgrading. This classification of the factors that influence upgrading is based upon two papers; 'Understanding and Escaping Commodity-Dependency: A global Value Chain Perspective' by Farfan (2005) written for the World Bank Group, and the paper: *Catching up Trajectories in the Wine Sector: A Comparative Study of Chile, Italy and South Africa* by Cusmano, Morrison and Rabellotti (2010)⁴, a scientific approach of the evolution in the wine industry. These two papers have an overlapping description of the factors that play a role in a value chain which conforms to my point of view of this section.

⁴ The paper of Cusmano et al. (2010) is used for the theoretical study after the empirical research was finished.

2.6.1 Upstream factors

The upstream factors are all the actions at firm level and therefore can also be seen as the supply side. These factors are located in the cluster of the producing firm. The most important factors influencing upgrading at the supply side of the value chain are: (I) Proximity, (II) Firm size & coordination, (III) Knowledge base & innovation, and (IV) Entrepreneurial drive.

Proximity: As we discussed earlier in this chapter, proximity is a central subject in this paper. The importance of proximity can be seen in the evolutionary economic geography. The several forms of proximity, discussed by Boschma (2005), are also important for upgrading. Cognitive, organizational, social and institutional proximity are needed for firm to understand each other when they cooperate.

Geographical proximity is necessary to transmit tacit knowledge in order to achieve innovation. Face-to-face contact is needed to communicate this type of knowledge. Unlike codified knowledge that does not need geographical proximity to be transferred. Temporary proximity can be sufficient for transmitting tacit knowledge. Meetings could take place in conventions or fairs. Contact with an external consultant can also be seen as temporary proximity.

Permanent geographical proximity however, can be more convenient for firms. This will have a bigger chance that formal and informal meetings between employees of several firms take place. With these interactions between employees, there is a social bonding created between the firms. Trust is created from this social bonding. Trust is very crucial for the cooperation of firms and the sharing of knowledge. When employees switch between different companies in the clusters, the tacit knowledge from their former firm is also shared more easily with their new employer. Studies have shown that spin-offs usually locate near its mother company. This is another reason for knowledge spillovers to occur. So knowledge flows more easily in a cluster due to geographical proximity, what enhances innovation and upgrading of the cluster.

Firm size and coordination in a cluster: The size of a firm can play a crucial role in the ability to upgrade or when it wants to achieve economies of scale. The benefits that arise from this can lead to more a more efficient production process and an increasing share of the value chain by obtaining more activities. The size of the firm is also critical for the commercial ties with global leader firms who prefer to do transactions with a reduced number of large preferred suppliers (Farfan, 2005). With the increasing size of a firm, the financial resources are also bigger compared to smaller firms. An important constraint for firms to upgrade is the lack of financial resources. This is more common to starting firms who do not have a large financial buffer. Without sufficient financial resources investments are not easy to perform. Investments can be seen in forms of the purchase of new machinery, implementation of new technology or an expansion of the building. Without these investments upgrading is not possible. Even outsourcing of some activities require funding. That is why financial resources are an important factor for upgrading.

So in order to achieve the benefits of economies of scale, to become an important player in the global market, or to increase activities in the value chain, the firm has to grow. However, the possibility to expand is not always present. The company can have skilled employees; access to technology, sufficient financial resources, a good tax climate, good access and know-how of the markets and the willingness to upgrade, sometimes there is not always the possibility to upgrade in certain ways because there is no room to expand. A firm can be located in a popular cluster where the availability of land is limited. The building of the firm can also be restricted to expansions

because the cluster is too crowded. A firm can also have some restrictions imposed by governmental agencies.

Proper coordination between the firms in a cluster can overcome these constraints. Joint investments are a solution to the constraints of smaller firms that are not able to grow and for starting firms. By cooperate in the purchase of goods, technology and knowledge, the benefits larger firms achieve can also become available for smaller firms.

Knowledge base and innovation: Upgrading often depends on the amount of knowledge present in a cluster. A university, a research centre or other firms in the area can be crucial for the knowledge in an area. Cooperation with these institutions can lead to knowledge creation that is useful for firms. Especially for small firms and starting firms that do not have their own R&D department, the access to external technology can be crucial for upgrading. Larger firms however, can also benefit from the presence of these institutions. Certain difficulties that stand in the way of upgrading can be overcome with the help of external research facilities. These research facilities usually do not focus on one firm but aim to the entire region. Often the region endures the same problems in upgrading. This is where these universities and research facilities can assist and that is why the access to technology can be important for the upgrading of a cluster.

Apart from the presence of knowledge in a cluster, firms have to invest to obtain knowledge. Small and starting firms are often reticent in investing in technology and R&D often due to the lack of financial resources. Larger firms can be reluctant to invest in their innovation capacity because of risk aversion and other strategies (Farfan, 2005). This affects the technological capacity of a firm and holds back innovation.

Entrepreneurial Drive: Stimulation is an important factor in the upgrading of a firm. Stimulation can arise from the firm itself or from others. First, firms need to have the willingness to upgrade. They can be stimulated by the positive effects upgrading brings. But the negative effects of upgrading obstruct firms in their willingness to upgrade. They could be deterred by the costs or the risks upgrading could bring. Working in the same routines will avoid any risk and is therefore the best solution. Other firms do not upgrade because they do not want profit maximization, the current profit is sufficient and they do not see a reason to upgrade.

The stimulation can also come from external parties. Buyers, suppliers, the government, the market or other firms like leader firms can stimulate firms to upgrade. Firms will be stimulated to upgrade because they are rewarded by doing it (tax benefits, use or copy R&D outcomes of research facilities or bigger firms), of they can upgrade because they are forced to (buyers switch to other providers, falling behind in the market). This is why firms can be positively or negatively stimulated to upgrade by external institutions. But the willingness to upgrade also has a big effect on the actual carrying out of upgrading.

2.6.2 Downstream Factors

Downstream factors include all the actions that occur further down the value chain and are external to the producing firms. This part of the value chain can be regarded as the demand side. Four main factors can have an influence on upgrading in the demand side: (I) buyer-driven forms, (II) trade-related constraints, and (III) entry barriers to non-commodity industries.

Buyer-driven forms - The demand side of the value chain can have influence on the upgrading of firms further up the chain at the supply-side. Buyers like distributors and retailers can stimulate or force the producer to upgrade. Because of the increasing number of suppliers, producers have to upgrade to meet to the requirements of the buyers to guarantee a certain quality. In this case the buyers are demanding the producers to upgrade because otherwise they choose other producers. The consumers can also create stimulation and necessity by firms to upgrade due to certain quality and diversity expectations.

The buyers can also constrain upgrading by producers. If producing firms want to upgrade by acquiring new functions in the chain such as marketing and distribution, also known as functional upgrading, they can be constrained by the shifting market power in the value chain. Downstream players have an increasingly growing market power, due to asymmetrical global value chain governance (Farfan, 2005). This will constrain producers to move into high-value-added activities such as distribution, marketing and retailing. This shift of governance in the global value chain is the result of four strategic developments. (I) *Consolidation*: retailers and distributors are becoming increasingly bigger, stronger and more dominant in the market. (II) *Supply chain coordination capabilities*: Distributors are able to deliver products on short notice and at a stable price and quality. This gives them an advantage compared to the firms in producing countries (Farfan, 2005). (III) *Branding*: The consumer world is increasingly becoming a brand recognizing market. Multinationals like Coca Cola and Microsoft are brands that dominate the market. It is becoming increasingly difficult for newcomers to obtain a part in the brand dominated markets. This is a constraint to product upgrading for new producers that is difficult to overcome and can lead to downgrading to the dependence of these multinationals.

Entry barriers: If a firm involves into functional upgrading, the firm is acquiring more activities of the value chain in its business. This way the firm can obtain a bigger governing function in the value chain. More knowledge of the market and a bigger market share can be created. This can be an advantage in a competitive market and offer an escape to the commodity constraints created by downstream companies like distributors and wholesalers. Non-commodity industries that are skill-intensive and technology-based, offer a better base for development and positive externalities. Spillovers effects are created and they offer growth opportunities (Farfan, 2005). However, the entry barriers that firms can encounter may provide a difficulty. *Economies of scale* and *path-dependency* are the two most critical barriers young industries in small developing countries will face. This is due to their lack of 'initial' industry capabilities (Farfan, 2005).

2.6.3 The Institutional Framework

Apart from the factors divided on the upstream and downstream parts of the value chain, the national environment of the producing countries also contain factors that can have effect on upgrading. The framework condition describes the economic and political climate of a country and the structural drivers of industrial performance are more pointed on the industry of a country.

Policy framework: There is a growing consensus that the economic policies of producing countries contribute to the degree of commodity dependency in the value chain (Farfan, 2005). Agreements between countries do not always have a positive effect for producing firms on the global competitiveness. These agreements can content tax advantages or subsidies on certain industries. This goes both ways but usually affect different industries. A tax advantage for the export of the

automobile industry could result in subsidies on the imports of pharmaceutical goods. This agreement would have a negative effect on the domestic pharmacy industry because they would have a competitive disadvantage. In other cases, policy makers are passive in investing in technological capacities and human capital and are reticent in active intervention to address structural competitive barriers (Farfan, 2005).

Trade-related factors: Import tariffs in developed countries can be set up to protect local producers and subsidies can also cause a disruption in the price mechanism. These import tariffs and subsidies will lead to higher prices of import goods and lower prices of domestic products. This is a constraint for exporting firms who want to enter markets in developed countries. So the tax climate can influence the degree of upgrading in a cluster because it has an effect on the price of the product and therefore the competitiveness of the firm. Higher taxes can therefore stimulate or force firms to improve their products and production process in order to compete with other firms. But it can also be argued that a negative tax climate constrains firms to upgrade because of the disadvantage in competitiveness. So it can be argued in either way, but it is clear that the tax climate has an impact on the firms in a cluster in the ability to upgrade.

Structural drivers of industrial performance:

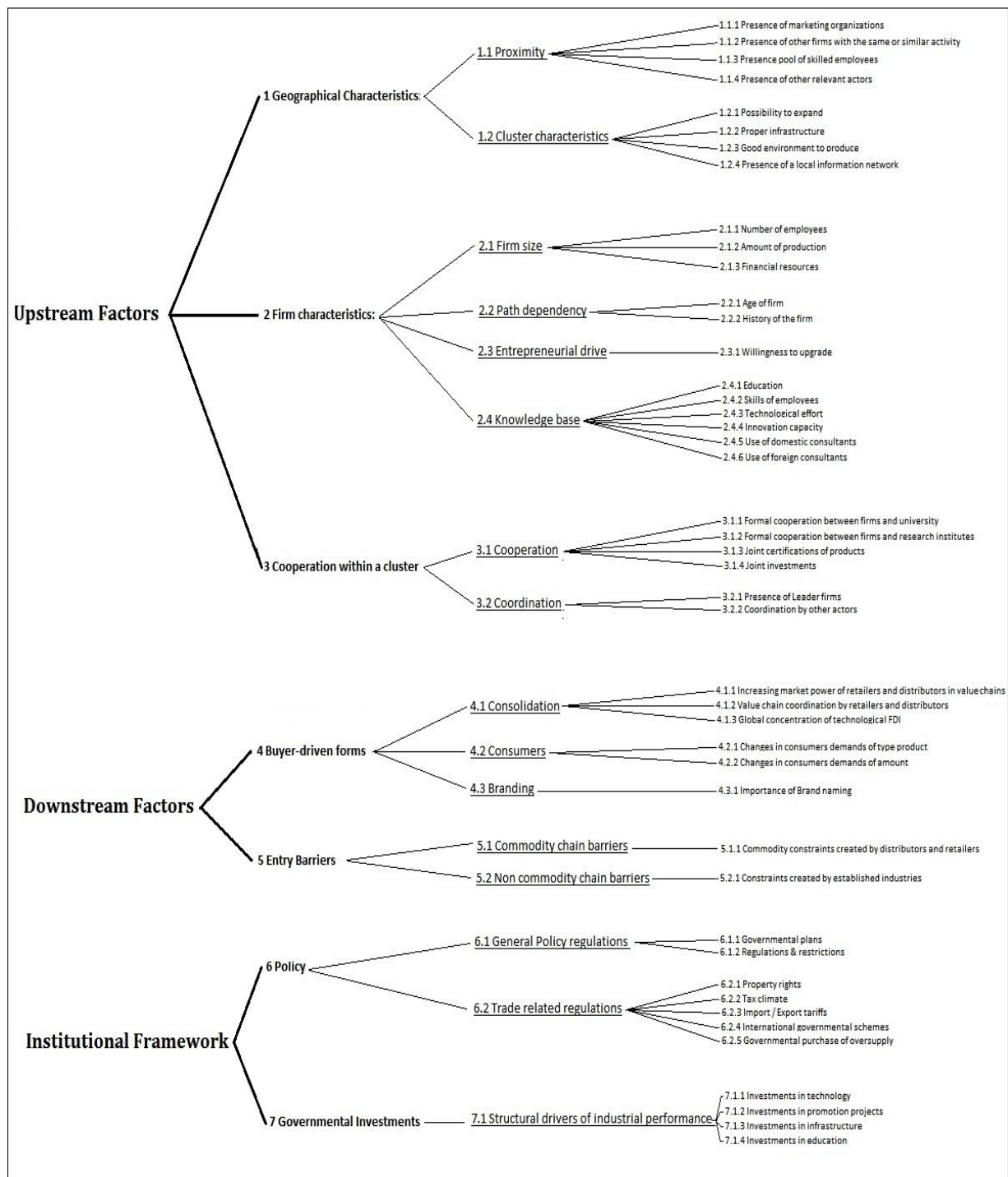
(I) Skills: An advantage of being located in the presence of other firms or universities is the pool of skilled employees. The lack of skilled employees can be seen as a constraint to upgrade. In a cluster of a specific industry a lot of skilled workers are present in the area; employees can switch between companies without any problem of changing their home address, expertise, etc. This inflow of skilled workers has continuity because the specialized clusters attract graduated students from universities. Another way to ensure that employees are skilled is to educate the current employees. The knowledge of the staff can be increased by offering trainings, seminars and courses. This will help to improve the skills of the employees of the firm and the firm can maintain their current employees. External consultants can more or less be seen as a combination of the two forms above. On the one hand, with attracting external experts the firms gets a temporary skilled worker. On the other hand, the external consultant often educates the staff increasing their knowledge and skills of the industry.

(II) Technological effort: The domestic investment in technology, R&D and science can be seen as a industrial driver that enables firms to upgrade (Farfan, 2005). Firms can import technology in order to obtain knowledge necessary to upgrade, as can be seen in Latin-America due to falling trade barriers (Katz, 2004), but this will make firms dependent on foreign technology and often become assemblers instead of innovation-based and fully-fledged industries (Farfan, 2005).

(III) Infrastructure: Good infrastructure can be important for firms in their upgrading process. A proper road, rail or water connection is crucial to gain access to the markets and the suppliers. So infrastructure needs to be present and in a good condition, otherwise it is difficult for firms to sell their products in the market. The IT-infrastructure also needs to be sufficiently present in the firm and in the entire area. Communication is also an important way to reach suppliers and the market. Deliveries and orders can be placed in time and it will give the firm the ability to react to changes in the market more rapidly. Another important advantage of a good IT-infrastructure is that firms can become more interactive with their clients. Direct communication via internet is an example that improves the interaction between firm and customer. This is becoming increasingly important in the digital age.

Figure 2.8 shows an overview of the different enabling and constraining factors of upgrading discussed in this section. It gives a clear view on how the factors are classified in this paragraph and provides a list of measurable variables of these factors. These variables can be measured in several ways, some of these variables can be measured qualitative, others can be measured quantitative. This list is not exhaustive, but this list of measurable variables covers all of the enabling and constraining factors of upgrading relevant to this research.

Figure 2.8: Factors that can influence upgrading described in variables



Source: M. van Nierop, 2010

CHAPTER III

GLOBAL TRENDS IN THE WINE INDUSTRY

3.1 Introduction

As described in chapter 2, the story continues about the evolutionary economic geography with a focus on clusters, value chains and the upgrading of clusters. But now it will be narrowed down to the wine industry. To understand the Brazilian wine cluster, it is important to start with an overview of the wine industry at a global level and to know how it has evolved. That is why this chapter is dedicated to the global trends in the wine industry and is mainly based on literature research. This will give insights about the wine industry in general, the recent trends and the story about several countries. These countries could be competitors that Brazil has to take into account. In this competitive market it is good to see in what ways other countries have succeeded or failed to conquer the wine world and apply it on the Brazilian upgrading. After this view on the wine industry in general, chapter 4 can focus on the Brazilian wine industry and its cluster 'Serra Gaúcha'.

To get insights about the developments of the wine industry, section 3.2 will deal with the global wine industry. The section will start with some recent trends in the global wine industry. This will emphasize the importance of the so called, *New Wine World Countries* in relation to the *Old World*. The section will continue with a sub-section (3.2.1) about the history of the wine industry. This will give some background information about how the wine industry has started and evolved over time. The next sub-section (3.2.2) will give insights of the emerging of the New Wine World countries. Several success stories about the emerging of these New Wine World countries will be told. This will give an insight about several factors that have contributed in the rise of a wine producing country and can be used as a comparison / mirror for upgrading of the Brazilian wine industry.

Section 3.3 will focus on wine clusters in general. This section can be referred to the theoretical section 2.2, but narrowed down to the wine industry. This section will describe which parts of the general cluster theories are applicable to the clusters in the wine industry. Section 3.4 is a part about the value chains of the wine industry. It will explain which actors are active in this industry. Also in this section we will apply the theory from chapter 2 on the wine industry, and in this case we will visualize the value chain with a model of the California wine cluster. The last section 3.5 is about which factors influence upgrading in clusters. There are several factors conceivable, as seen in chapter 2, but not all are important. This section will answer this question and dedicate to the important factors in the wine industry.

Figure 3.1: Wines in a wine cellar



Source: M. van Nierop, 2010

3.2 The Global wine industry

The global wine market is undergoing a significant transformation. The emerging of wines from the so called *New World* is causing a change in the supply side. The global wine market was originally dominated by several countries in Europe like France, Italy, Spain and Germany. These are seen as the traditional wine producing countries and are known as *the Old World*. For years they had no real competitors in the wine industry and were seen as the only countries that produced quality wines. But times have changed, no longer do Old World producers dominate the industry to the extent they once did (Aylward, 2002). Wines from the New World are produced in a bigger amount than ever before and the quality is improving with it. To be more specific, in the late 1980s, Europe's share of exports was approximately 96% and declined to 68.1% in 2000. In the same period Australia's wine exports have risen by around 1132%, from 40 million liters to 453 million liters (Aylward, 2002). And as can be seen in figure 3.2, besides Australia, other countries like South Africa, Chili, Argentina, and California (USA) are counted as the New World Countries as they have successfully increased their share in production and trade.

Figure 3.2: Exports from wine producing countries from 1990 to 2000

2000 rank	Profiled Countries	Millions of Liters			Change	
		2000	1999	1990	2000/1999	2000/1990
1	Italy	1,704	1,832	1,348	-7%	26%
2	France	1,509	1,611	1,233	-6%	22%
3	Spain	865	931	430	-7%	101%
4	USA	288	285	99	1%	191%
5	Australia	285	216	37	32%	670%
6	Chile	265	230	47	15%	464%
7	Germany	241	233	284	3%	-15%
10	South Africa	141	129	4	9%	3425%
11	Argentina	86	88	45	-2%	91%
Total- 9 profiled countries		5,384	5,555	3,527	-3%	53%
Total World Exports		6,289	6,549	4,442	-4%	42%

Source: Cholette et al, 2004

The emerging of the New World on the supply side is not the only change that can be seen in the wine industry. The demand side is also undergoing a transformation. The growth of the wine exports from the New World is accompanied with a decline in wine production and consumption around the world (Anderson, 2001). Especially the demand in the original wine consuming countries is declining. Countries like France and Italy are consuming less wine. It seems that this product is increasingly consumed in many countries where little or no wine is produced, like the UK (Smit, 2008). This is accompanied by the emerging of new wine consuming countries like China (figure 3.3). This is due to the increasing wealth in China and wine is increasingly getting popular.

Figure 3.3: Principal countries of wine consumption (1000 ton)

	Average for 1992/94	Average for 2000/02	Evolution (%)
France	5,249	4,426	- 16
Italy	4,262	3,937	- 8
USA	1,896	2,719	+43
Spain	2,247	2,317	+3
Germany	1,922	2,101	+9
Argentina	1,591	1,231	-23
China	524	1,128	+115
UK	710	978	+38
Russia	648	607	-7
Australia	455	603	+32
South Africa	672	585	-13
Portugal	525	496	-6

Source: Smit, 2008

3.2.1 The history of the wine industry

Although today wine is produced and consumed all around the globe, it is believed that the first production started around 7000 years ago in the Caucasus (figure 3.4). This region lies today in Georgia, which claims to be the oldest wine country in the world. In this area man discovered that the fermentation of the grapes from a wild plant could produce an alcoholic drink. This was the first invention of the product wine.

Figure 3.4: The geographical location of the Caucasus.



From this region, the knowledge of producing wine began to spread in the area. The grape that was used was the *Vitis vinifera*, what is still used today to produce wine. Later knowledge of producing wine spread along the coasts of the Black and Mediterranean Sea, reaching Egypt, Greece and south of Spain. The Etruscans began vine cultivation in central Italy using native varieties in the 8th century BC, which is also when the Greek colonists began to take cuttings to southern Italy and Sicily (Anderson, 2001). The Romans were mainly responsible for the spread throughout the biggest part of Europe. The Romans brought the knowledge of producing wine in areas that are now known as the classical wine areas like Bordeaux. And they were the first that gave names to certain wines, what gave the opportunity to distinct different sorts of wines. This started the first competition among wines, what made improvement of the quality necessary. Around the 4th century AD the wine cultivation was well established in the Old World of Europe and North Africa (Robinson, 1994 in Anderson, 2001).

After the fall of the Roman Empire, the wine industry practically came to a stop. There was no more development or spreading of wine. Thanks to monasteries, the wine producing survived these dark ages. In Christianity wine is seen as a necessity, so there was a task for the monks to preserve the viniculture as was the ability to produce wine. From the 9th century the expansion of the viniculture was back on track. Emperor Charles the Great stimulated the construction of monasteries and with that the wine production expanded also in great parts of France and Germany. The Bourgogne is an example of an area created by this emperor where a famous white vineyard is named after him, Corton-Charlemagne. The rising of cities and bourgeoisie around 1500 contributed to the further expansion of the wine industry in Europe.

The first explorers of the New World took vine cuttings and know-how with them first to South America and Mexico in the 1500s and to South Africa from 1655 (Anderson, 2001). From 1600 the English and the Dutch started to engage a big scale international wine trading. And they largely determined what kind of wine a region must produce, the first market-oriented thinking.

Until the 18th century all wine was transported in barrels. The possibilities to conserve the wine were therefore limited. The use of well conceived bottles would change this. Wines could be held for a longer time. The bottles were blown by mouth and had a content of around 75 centiliter. This would later be the standard size. The 19th century can be characterized with some high and low peaks in the wine industry. Three great plagues that came from America ravaged the European vineyards. They threatened to destroy the viniculture in Europe for good if there was no cure found.

The 19th century was also a time of technique and industrialization. A cure was found for the plagues and vineyards started to improve their wines. Modern oenology, started to rise thanks to the French scientist Louis Pasteur. He made a numerous inventions involving the improvement of the quality of the wines. The upgrading of the French wine industry resulted in an enormous expansion in the export of French wines and made France the Capitol of the wine producing countries.

At the end of the 19th century, man began to realize that the names of the areas of origin had to be protected against false use. Some areas had been doing this for some time now, but it took until 1935 when France set up rules that protected the names of wines from this country and was called *d'origine controlées*. After this first creation of a certification, other countries would follow. Apart from the areas of origin, the names of the producer would also become an indication for quality.

In the 20th century, technology was even more important for the wine industry. Not only on the vineyard, but also in the cellar innovations would take place. Just like in other industries, mechanism would enter the wine industry, making the process more efficient. Until the end of this century, the wine industry from countries of the Old World would flourish and dominated the world.

From the 1970s, new wine-making areas started to develop properly and entered the wine industry. At that time, the new emerging countries were small players and were no threat to the traditional wine producing countries. California was one of the first to emerge. The Australians followed in the 1980s, and in the 1990s Chile and Argentina made a breakthrough in the international markets. Even so, globalization of the wine industry still had a long way to go. The largest producers were often also large chauvinistic consumers, practically all wines that were consumed was produced in the same country (Rachman, 1999). From the year 2000 wines from South Africa and New Zealand exported large amounts of wine and claimed their spot in the international wine industry. A shift in the industry began and wines from the New World became increasingly popular, making it a big treat to the traditional producers of the Old World.

One of the strategies of the New World producers is that they take every opportunity to improve and change their production of wines. A Director of a winery said: *'Traditional ways of production are less 'sacred' than in the traditional countries. Also are there fewer rules in these countries that constrain them to produce different types of wines. Wines from the New World are popular because the taste is more easily accessible to a larger group of wine consumers'* (Interview, 16-02-2010).

3.2.2 Upcoming new world wines

A lot of new countries emerged in the wine industry in the last decade. Each of these countries had upgraded their wine industry in order to enter the global wine market. The upgrading of the industry seems to be necessary to survive in a world where established wine producing countries are aggressively implementing strategic actions to increase wine exports (Fensterseifer, 2007) and, at the same time, global consumption is decreasing (Anderson, 2001).

A lot of stories can be told about the problems and the difficulties the emerging countries have endured. It is interesting to see what happened in other New World countries and how the upgrading process evolved over time. This gives a good opportunity to see if there is any similarity noticeable with the upgrading of the Brazilian wine industry. Perhaps some lessons can be learned from the evolving industries of the other countries and can be implemented in Brazilian wine industry.

In this sub-section 3.2.2, some wine industries from some New World countries will be discussed, starting with the industry from the State of California, USA. Other countries that will be covered in this sub-paragraph are; Argentina, Chili, Uruguay, South Africa, Argentina and New Zealand .These industries were selected because they play an important role in the global wine industry and have a significant amount of export that they deserve to be counted for.

California

The only wine industry from the New World that is located in the Northern Hemisphere is in California, USA. Although other states in the United States produce wine as well, they do not produce a significant amount of wine that is worth counted for. The state of California has a wine industry accounting for 95% of total US wine production (Guthey, 2008). Moreover, California is the only state that exports significant amounts.

The first attempts to produce wine in the USA were along the east coast in 1619, but these were unsuccessful. It took until the Spanish-Mexican Jesuits moved to California and started the cultivation in the early 19th century before wine producing flourished in the USA (Anderson, 2001). In this period traditional wine producing countries in Europe were suffering from an American plague that destroyed many of their vineyards. Ironically enough the Californian wine industry flourished at that same time (Anderson, 2001). The production was at maximum capacity and the export was booming. Everything seemed to be in perfect condition until the government ended this in 1920 with the National Prohibition Act. The sales, transportation and most important the manufacturing of alcohol for consumption was prohibited nationally. This was, of course, killing for the wine industry in the United States.

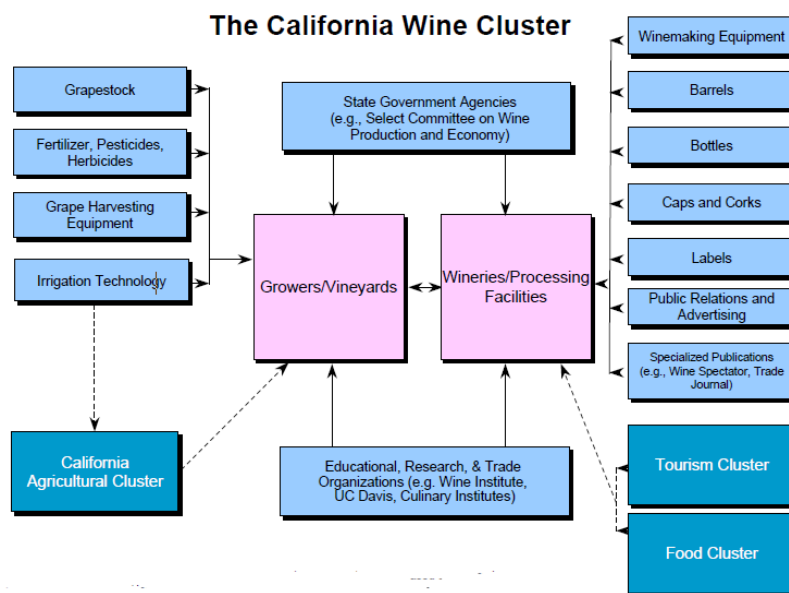
The National Prohibition Act lasted until 1933. By this time most of the wine producers were out of business. Some survived, these companies produced for medicinal and sacramental purposes. Some others changed their core activity to producing non alcoholic grape drinks. With the Prohibition Act gone, the American wine industry was available again for producing wines. But in the 13 years the production of wine was prohibited, the knowledge how to make good quality wines seemed lost as well. The market was overwhelmed with poor quality wines and this had an effect on the reputation of Californian wines as well. Slowly the amount of vineries grew and the quality was getting better, but much improvement was needed.

In the 1960s the vineyards received a knowledge input from the University of California at Davis and Fresno State University. At these Universities, there was research about the improvement of the production and the quality of the wine. With the coming of these external knowledge linkages, the quality soon raised to a level of the highest international standards. Another factor that was crucial to the upgrading of this industry was the evolving internal social and economic relations of producers. Mechanisms for interaction among producers to promote similar sorts of conventions to those that have been crucial to the development of premium wine production in California (Guthey, 2008).

With this, the reputation of the Californian wines improved as well and so did other industries who were somehow involved with the cluster. The tourism and the food cluster are good examples of this (Porter, 2003). Today, California has 680 commercial wineries as well as several thousand independent wine grape growers (Porter, 1998), and it's the fourth producer of wines in the world (Armstrong, 2006).

So it seems that external factors can have a great impact on a wine industry, or any industry in particular. In this case the National Prohibition Act had a negative influence that almost put an end to the wine industry in California. But today it's one of the leading producers of the world, due to several factors that upgraded the industry, like external knowledge and improving relations between wineries and firms of other industries inside a cluster (figure 3.5) what can provide knowledge spillovers.

Figure 3.5: The California wine cluster



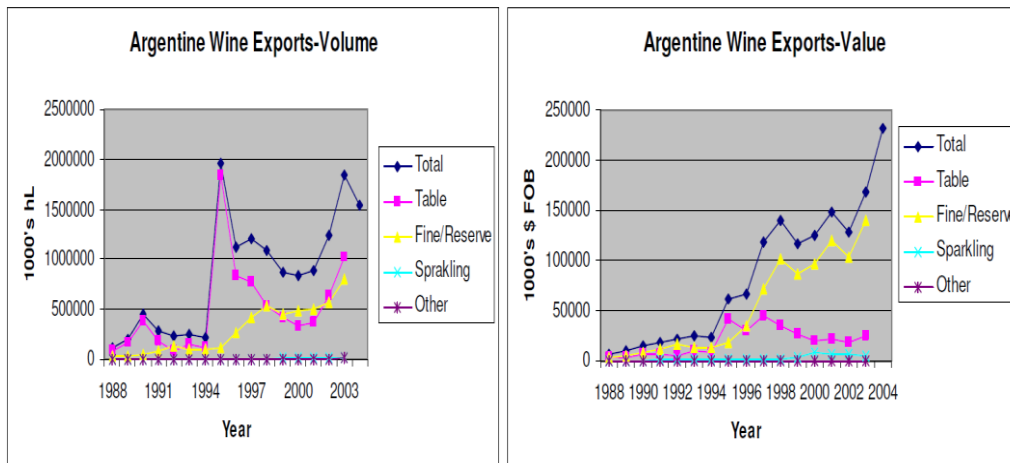
Source: Porter, 2003

Argentina

Argentina has the oldest wine culture outside of Europe and is the sixth largest consumer of wine worldwide (Cholette et al, 2004). The Argentines first started to produce wine in 1541, grapes were brought in from Spain and were planted along the Atlantic Coast. Slowly production started to expand and several areas were designated as vineyards. The intention to produce wine was present, but the knowledge was lacking. Therefore in 1853 a French wine specialist was hired to develop the wine industry. He was sent to the vineyards in Mendoza, geographically one of the best located areas to produce wine. It's topography, geology and weather made it ideal to produce good quality wines. Mendoza began to develop, the production of wine expanded rapidly (Fleming, 1979). Mendoza became an area where the best wines from Argentina were made, even today this area is very prominent in the wine industry.

From that time on, Argentina began to produce enormous amounts of wines. It became one of the largest volume producers and per capita consumers of wine, but had no attention for quality anymore. This lasted until the end of the 1980s. The market was heavily regulated and dominated by a few large producers of high volume, low quality table wine for captive domestic consumers (McDermott, 2005). In the 1990s, Argentina went through some pro-market reforms, liberalization and privatization made it possible for foreign investments to come to invest in several industries including the wine industry. These FDI's (Foreign Direct Investments) helped the wine industry to survive when the country went bankrupt in 2002.

Figure 3.6: The Growth of Argentine Wine Exports (by Volume and Value)



Source: McDermott, 2005

The most structural changes in the Argentine wine industry in terms of upgrading were made in the 1990s, but like other Latin American countries, this transformation is also noted for its sub-national variation (Giuliani et al, 2005). In this case, two dominant wine producing areas, Mendoza and San Juan, had undergone different types of upgrading in the 1990s. Mendoza had built a new constellation on institutions and networks that support sustained improvements in processes and product innovation from a wide variety of firms (McDermott, 2005). Knowledge creation and improvements in production were the core issue in this area. San Juan hasn't upgraded that revolutionary as Mendoza, but it had similar social and economic preconditions and advancing policies that assured that new and sufficient investments were made (McDermott, 2005).

As in figure 3.6 can be seen, in 1990 Argentina shipped 45 million liters, and in 2000 it exported 86 million liters, an increase of 92% over the decade (Cholette et al, 2004). A great deal of this increase is due to the upgrading of the industry. Several types of upgrading were implemented in the 1990s, which helped the industry to rise and overcome external shocks. Types like attracting new investments, network building between different actors and firms, process and product innovation, knowledge creation, were all important factors in the upgrading of this industry in Argentine and made it the fifth leading wine producer in the world today (Figure 3.7).

Figure 3.7: Wine Production by Profiled Country

rank in 2001	COUNTRY	Volume- billion liters	change: 2001 vs. 1997-2000	
		1997-2001 average	2001	
1	France	5.6	5.3	-4.8%
2	Italy	5.3	5.0	-6.0%
3	Spain	3.5	3.1	-12.7%
4	United States	2.2	2.1	-3.4%
5	Argentina	1.4	1.6	16.0%
7	Australia	0.8	1.0	34.8%
8	Germany	1.0	0.9	-13.9%
10	South Africa	0.8	0.6	-15.8%
11	Chile	0.5	0.6	5.2%
World Total		27.1	26.7	-1.6%

Source: Cholette et al, 2004

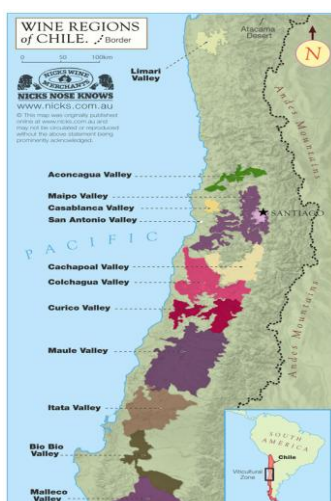
Chili

Figure 3.8: Location of Chile



Just like Argentina, Chile has a long history in wine production. Ten years after Argentina started to make wine, the Chilean wine production started. In 1551 the Spanish conquerors brought the viticulture to Chile during the colonial period for religious purposes (Visser & de Langen, 2006). They started by importing Spanish wine but also started to plant a vine variety called *Pais*. The production of wine started in the area near Santiago but quickly expanded to other areas (Giuliani, 2003). In the 19th century some external factors influenced the success of the wine industry. These factors were changes that events that Chile experienced and changed the country. A period of economic growth came after the independence of 1808, which gave a boost to the entrepreneurial activities in Chile. In this same period European and North American immigrants started to populate the country (Giuliani, 2003). The purpose of production also changed from religious to commercial reasons. This change also implied the change from Spanish to the cultivation of French grapes. Wealthy wine producing families were inspired by their visits to France in the way the French produced wine and began to import French vine to plant in Chile. Some of the popular grapes that were imported are Sauvignon Blanc, Merlot and Carbernet Sauvignon and still are most produced grapes in Chile. In order to make sure that the production was done properly, French technology was imported. That also involved the hiring of some French oenologists to assist in the production of these new vine species. These early flying wine makers made sure that the French knowledge of wine production was transferred. From 1850, quality started to improve and with the outbreak of *Phylloxera* (*a pest of commercial grapevines*) at the end of the 19th century in Europe, the export of quality wine was stimulated, because the outbreak did not reached Chile (Visser & de Langen, 2006). These changes had big influences in shaping the evolutionary trajectory of the industry over the years (Giuliani, 2003). In the 20th century, wine production slowed down due to several political factors and it lasted until 1980 until the Chilean wine industry started to grow again. From that point, growth was remarkable. In 1984, Chile exported only 2% of their wine. In 2002, this figure rose to 63%. And the same period the export value rose from 10 million US dollars to 602 million US dollars in 2002. (Visser & de Langen, 2006). Today Chile is the fifth largest exporter of wine in the world.

Figure 3.9: Wine regions in Chile



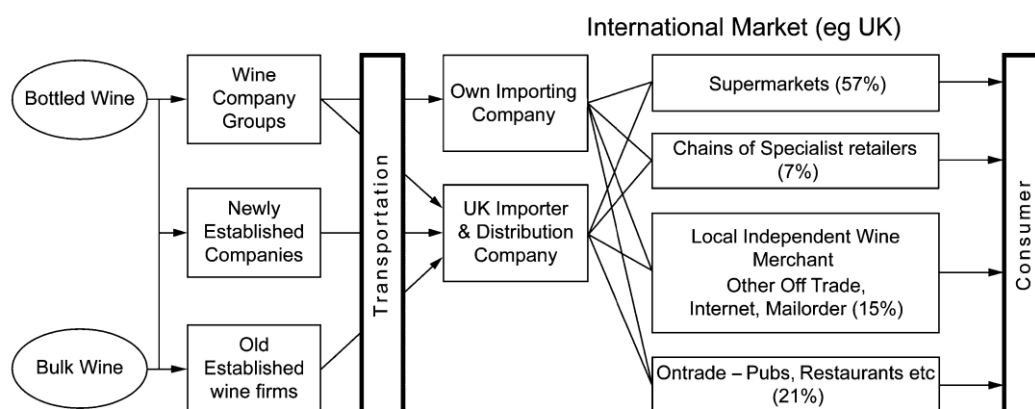
One of the reasons for the success of the Chilean wines is the climate. Because of the long stretched shape of Chile, different weather conditions can be found in this country from hot and dry in the north to more wet and cooler in the south. The climate varies between the Californian and French. The wine regions are located between the Andes mountains and the Pacific ocean (figure 3.9), keeping the grapes protected from cold/hot temperatures and the soft breeze of the ocean. But clearly the climate and the quality of the soil is not the only reason for the success of the Chilean wine industry.

Financial investors from Europe and the US made it possible to implement upgrading processes in the Chilean wine industry. These investors were attracted by the unique climate and soil, but also by the low costs of labor, land and real estate (Visser & de Langen, 2006). New technologies were adapted from the US and France and flying winemakers were consulted to import knowledge of producing wine. One of these technologies is the conversion from the aging of wines in barrels made from 'rauli' beech wood to French and American oaks or stainless steel tanks. This improved the quality of the wine and removed a specific taste that came from the Chilean barrels that were unpleasant consumers around the globe. The change in the global wine market caused a bigger demand for New World wines. For Chile, this resulted in a lot of newcomers in the industry. The number of wineries started to increase from 1990, what made the industry more dynamic (Visser & de Langen, 2006). Some firms are much bigger than the rest what could indicate the presence of leader firms, but any form of leadership in the development of a shared vision of the Chilean wine industry is absent. The Chilean government also seems to lack involvement in the development of the wine industry. (Visser & de Langen, 2006).

Downstream the value chain, the Chilean wine is mostly sold in supermarkets. In figure 3.10 it can be seen that in the UK this figure is 57%. What implies that the biggest market share of Chilean wines is in the hands of (large) supermarkets.

The Chilean wine industry proved that it is open for all changes that improved the quality and efficiency of wine production. With no big constraints, the Chilean wine industry proved that it made a lot of effort to upgrade and the result is that production and export figures are booming. And together with this success, the tourist industry successfully co-evolved with the wine industry. These two industries combined their strength and with the upgrading processes they evolved into successful industries. Although the Chilean wine industry seems a total success story, it still faces coordination problems that collective actions and investments bring along. So the governance is not yet fully developed, cooperation with organizations like Viñas de Chile, Chilevid and several university research institutes could make sure that coordination is improved in the area (Visser & de Langen, 2006).

Figure 3.10: Chilean wine value chain downstream to UK market



Source: Gwynne, 2008

South-Africa

The history of the wine industry in South Africa starts at 1655. In that time many Dutch and English traders dominated the seas and brought products to places in the world where they were not before. In this case the Dutch brought the viniculture to South Africa (Anderson, 2001). In the beginning, the meaning was to produce wine that could be used to ward off scurvy continuing on their voyages along the spice route. Later, it was focused on production for domestic consumption and export. The quality of the wines was not very good in the beginning, because the first wine farmers were the colonists who were living after they had retired as sailors or soldiers. With no former experience in farming, these colonists would never be good farmers. Therefore the VOC brought Dutch emigrants who had experience to the Cape area to settle there as farmers (Feinstein, 2005). The quality began to improve and the region near Cape town became famous for its dessert wine 'Constantia' (WOSA, 2010). Most of the vineyards were located in the area around Cape Town, some other great vineyards were concentrated near Stellenbosch and Paarl. In figure 3.11 you can see that today, the wine is produced in parts spread across the Western Cape mostly along the coast (WOSA, 2010).

Figure 3.11: The location of the wine production in South Africa



Source: Wines of South Africa, 2010

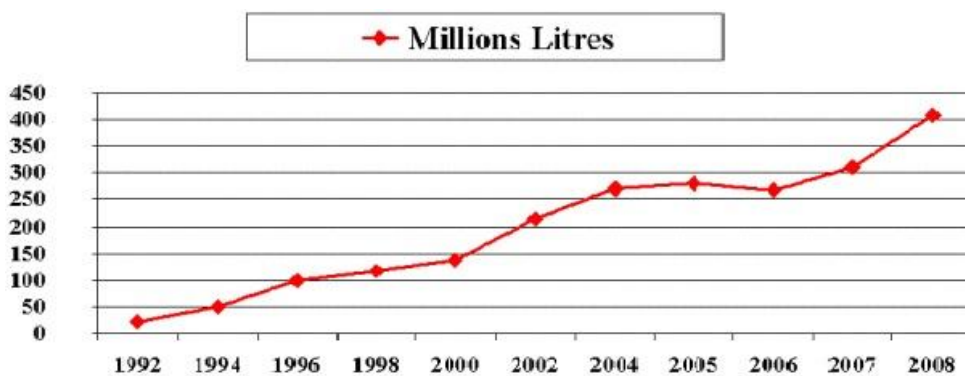
Around 1900 the KWV (Koöperatieve Wijnbouwers Vereniging van Zuid-Afrika Bpkt) was formed. The KWV (or Cooperative Wine Growers of South Africa), began as a cooperative that protected the farmers who were involved. But they grew so big that they had the control of the entire wine market and started to control the prices. The production shifted to an aim to produce primarily for the domestic market. With the majority of grapes being sold by producers and their cooperatives to the KWV, guaranteed prices protected producers from market variation, creating a distorted market that favored mass production of low quality grapes and doing little to reflect the unique territory of the Western Cape. Innovation was effectively stifled as 10 producers had no real incentive to upgrade technology or skills. International boycotts and sanctions exacerbated these inward-looking characteristics of the industry (Bek, McEwan & Bek, 2007). Before the 'apartheid', the sales were only permitted to the white population of South Africa.

The quality was poorly but times have changed since the end of the Apartheid. Although some improvements were made before 1990, the substantial upgrading had started during the 1990s. The industry restructured completely to meet the demand of the international markets. One thing they do to upgrade is to make use of external knowledge. New entrepreneurs have travelled the world to acquire knowledge of the latest technologies and marketing concepts and have operationalized these

in South Africa (Bek, McEwan & Bek, 2007). Today, the South African wine industry has changed in such a way that the production is for export is increasing each year. The export rose from 25 million liters in 1992 to 410 million liters in 2008 (figure 3.12).

So from the end of the apartheid and the changed focus from the domestic market to the international market has contributed to the upgrading of the South African wine industry. The removal of the protection of the farmers and the removal of the trade barriers had forced the winegrowers to upgrade their production in order to survive the competitiveness. External knowledge from global linkages helped to improve the production as well. But the upgrading picture emerging from the South African case is more complex than just improved product quality, better processes and some functional upgrading. (Ponte & Ewert, 2009). It was part of a much greater change that had affected many other industries in South Africa as well.

Figure 3.12: Total exports of South African wines



Source: *Wines of South Africa, 2010*

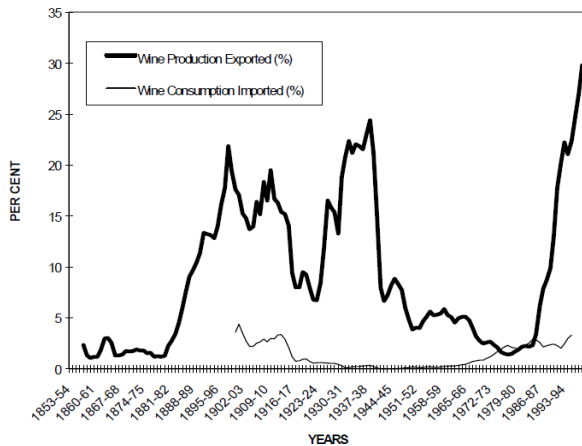
Australia

The first grape cultivation in Australia began with cuttings imported by the earliest British settlers in 1788, but it took until 1850 before the production for commercial use was spread throughout the country (Robinson, 1994). Four years later the first export came at a volume of 6.291 liters and was shipped to England. The Phylloxera plague that infected Europe in the mid 19th century also hit Australia two decades later but wine regions in the South were kept free from this plague (Anderson, 2001). The first form of upgrading in this country was the investment in formal grape and wine research, education and training and took place in 1883 at the Roseworthy Agricultural College (now part of the University of Adelaide) and received its diploma in oenology in 1934. The Australian Wine Research Institute was created in 1955 and was adjacent to the University of Adelaide as well (Anderson, 2000).

This knowledge creation evolved to a level what it is today. There is a lot of attention for the education in viticulture in Australia and it enjoys a high level of well-trained graduates in Wine Science. One of the difficulties now is the diffusion of this knowledge. Regional areas seem to be inadequate to absorb this knowledge and implement it on their firm to gain profit from it and start their upgrade (Alkward, 2002). But perhaps the problem lies in the absorptive capacity of the firms instead of the difficulties of diffusion knowledge.

The Australian wine industry is developed from a small domestic wine supplier to the fourth largest exporter of wines worldwide (Aylward, 2002). This change took place in the mid-1980s and can be explained by the fact that the Australian exchange rate was in a decline and that influenced the demand (Marsh & Shaw, 2000). This meant that the export of products became more attractive because of the low value of the Australian dollar.

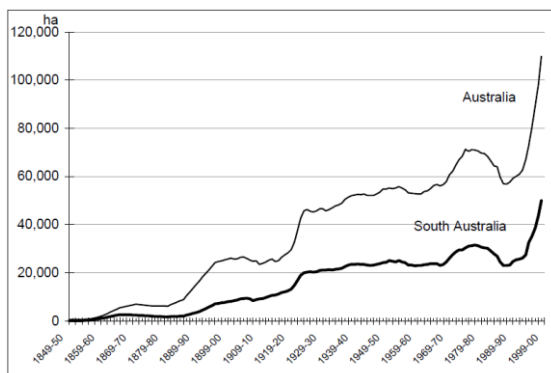
Figure 3.13: Wine production exported and wine consumption imported, Australia, 1853 to 1994 in %



Source, Anderson, 2001

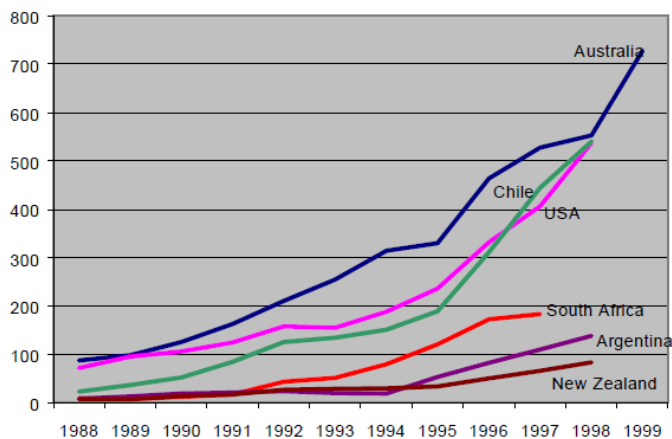
Other factors that could have influenced this change in the industry and the commitment to innovation was the change in industry ownership affecting the structure and scale of individual firms. Larger amounts could be produced and firms could work more productively. The shift from a domestic to a global market is also a good explanation for the upgrading of the industry, because of the amount of competitors in the global competition in comparison with the competition of the domestic market. With the focus now on the global market, the percentage of export grew from 2% to 30% (Figure 3.13). Not long after this increasing amount of exports, the area of vineyards also increased (Figure 3.14). In volume the export grew in the 1980s from 8 million in 1981/82 to 39 million in 1987/88, that is an increase of 489.5% in 6 years. Throughout the 1990s, the production and the export continued to grow and made it the fourth largest exporter of wines today with an export record of 805 million liter in 2007. And as can be seen in figure 3.15, Australia received the highest value of exporting wine from all New World wine producing countries.

Figure 3.14: Area of vineyards, Australia and South Australia, 1849-50 to 1998-99



Source: Anderson, 2000

Figure 3.15: Value of wine exports by major New World producers (US\$ million p.a.)

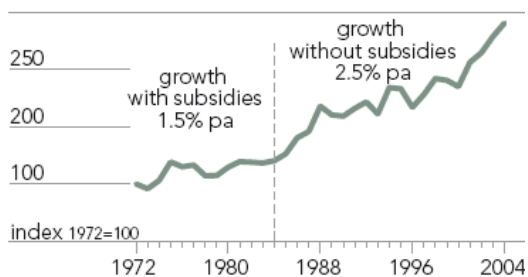


Source, Anderson, 2001

New Zealand

The export of wine in New Zealand started to rise since the economic reforms of 1984. These reforms were needed because of the economic crisis New Zealand faced and free market politics seemed to be the answer to these problems. The economic reforms had transformed New Zealand from one of the most regulated economies in the OECD to arguably the least regulated (Brash, 1996). One of the first reforms were in the financial sector. All controls on prices, wages, credit, dividends, foreign exchange and out-bound overseas investment were lifted in 1984 (Brash, 1996). With the removal of the trade barriers, the international trade expanded. Public assets were privatized, with that banks got more room to put out loans. And, maybe most important for the wine industry, the subsidies on several industries were removed. Especially the agriculture got a lot of subsidies what gave no chance for other industries to flourish. This liberation of the market gave industries a chance to rise and improve their production. It gave room for innovation, efficiency and productivity grew significantly (see figure 3.16).

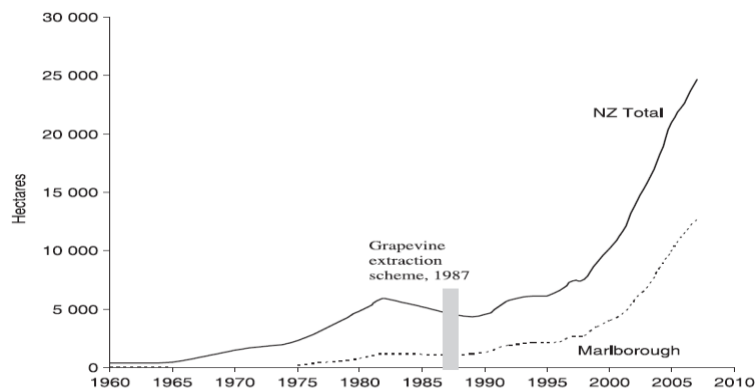
Figure 3.16: Total Factor Productivity Before and After the Reforms



Source: New Zealand Ministry of Agriculture and Forestry (2006a) in Vitalis, 2007

Before the reforms, the wine industry was mainly focused on the domestic market. There was relatively little export, and the wine production overall was modest because of the subsidies. Subsidies given to the meat, wool and dairy production were not available for the wine industry, with farmers responding to these signals by focusing production where the subsidies were provided. After the reforms, the export of wines expanded from less than US\$10 million in 1983-4 to US\$ 125 million in 2004-5 (Vitalis, 2007).

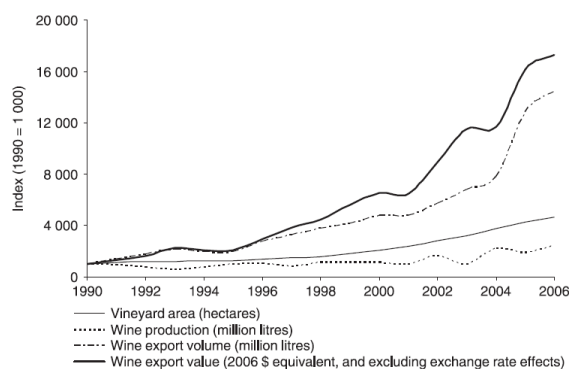
Figure 3.17: New Zealand Vineyard area of grapevines in production



Source: NZ Department of Agriculture, NZ Ministry of Agriculture, Wine Institute of New Zealand, Winegrowers of New Zealand in Hayward and Lewis, 2008.

From these reforms came the ‘Grapevine extraction scheme’ in 1987. This was a government-sponsored program to reduce the oversupply at that time and was an important milestone for the New Zealand wine industry (Hayward and Lewis, 2008). Not only made it expand the amount of wine produced, but more importantly, it upgraded the quality of the wine from a low value, high-yielding varieties to globally recognized, fine wine varieties, and hence the foundations for an export-oriented industry (Hayward and Lewis, 2008). The government worked as a catalyst of change, new entrepreneurs and winemakers began to open up new regions and enhanced innovation of the production due to the liberalization of the market and larger wine enterprises got the opportunity to alter their operations and incorporate new technologies and practices (Moran 2000; Barker et al. 2001 in Hayward & Lewis, 2008). The upgrading of the wine companies made an enormous difference in the New Zealand wine industry. Several global recognized brands emerged and large areas are now producing quality wine. As figure 3.18 shows, these areas are have expanded from 1990 to 2006. It also shows the increasing amount of wine production, export volume and value.

Figure 3.18: Indices of New Zealand wine industry growth



Source: Wine growers of New Zealand, in Hayward & Lewis, 2008.

3.3 Wine clusters

Having discussed several success stories of wine industries from the new world, this section will focus on the clustering of wineries in these regions. It is claimed that some regions are labeled as wine clusters, but critics refute this and claim that in some cases the geographical proximity of firms is nothing more than a agglomeration of firms from the same industry. In this paragraph we want to bring forward to what extent clustering is common in the wine industry.

Porter (2000) used in his paper *'Location, Competition, and Economic Development: Local Clusters in a Global Economy'*, the example of the Californian wine cluster to explain the concept of a cluster. It is arguable to say that the firms are located in a proximity of each other, because 95% of all the US. wine production comes from California (Guthey, 2008). However, critical sounds come from Mueller and Sumner (2005). They claim that the consideration of the California wine industry to be seen as a cluster is not completely true. They argue that the wineries are scattered among 17 districts of more than 100.000 square miles and if you can speak of a cluster based on geographical proximity, there are at least 2: The Central Valley and the Coastal Districts. But this leaves out wineries and these 'clusters' are also widely spread on a map (Mueller & Sumner, 2005).

Porter (2000) argues that clusters are not just defined on their geographical proximity but also by their interconnection between companies from the same of a similar industry. This can be seen in the Californian Wine Cluster where important relationships are made between grape growers and wine makers and it has evolved to a network that enhances access to finance, reduce risks and avoid bargaining costs (Mueller & Sumner, 2005).

The Californian Wine cluster cooperates with the University of California to obtain a certain amount of knowledge and therefore a research centre is necessary for a wine cluster in order to keep upgrading its capabilities. But Mueller and Sumner (2005) claim that the information network is not local because many, if not most, oenology students are from outside California. And flying winemakers play an important role in the global network, and not in a cluster.

The success of upgrading the Chilean Wine Industry is partly due to these flying winemakers. These flying winemakers are the strongest link to networks of knowledge for the firms of the Chilean wine cluster *Colchagua* (Pietrobello, 2004). Lagendijk (2003) describes flying winemakers as:

"Expert oenologists travelling around the world to advise local winemakers. Such advice can entail quick fixes for acute problems, like 'wine doctors', but also a long-term project of vineyard and wine development. Flying winemakers bring state-of-the art knowledge and experience in grape cultivation, fermenting, processing, and blending, based on most recent technological development, combined with practical knowledge of marketing strategies and trends. Regarding marketing, they facilitate, to use the term used earlier, 'the commoditization of culture', in which 'culture' denotes the constructed identity of a local wine area. Besides knowledge, they also play an important role in spreading the use of grapes with world reputation such as Cabernet Sauvignon and Merlot, thus facilitating the 'globetrotting for grapes' (Priol 2000). Such expert winemakers are mostly educated in one of the world's 'wine universities': Roseworthy (Australia), Montpellier (France), or David College (Berkeley, California). Flying winemakers, and the centers in which they are educated, have played an important role in the success of new wine regions. From the perspective of traditional wine

production, flying winemakers can be considered as genuine 'modernizers' that set out to substitute modern technology and management for historically evolved practices".

So these flying wine makers can play an important role in the knowledge base of wineries (see figure 2.9). Upgrading of the knowledge base is important for the innovativeness of firms in the wine industry and improvements in the production of wine. Foreign advisors play a similarly important role in the Brazilian wine cluster (Vargas, 2001). A spokesman of Miolo also claimed that they use a flying wine maker from France to continuously being updated of new technology. More about the flying wine makers in Brazil will be discussed more in chapter 4.

Figure 3.19: Wine cellars



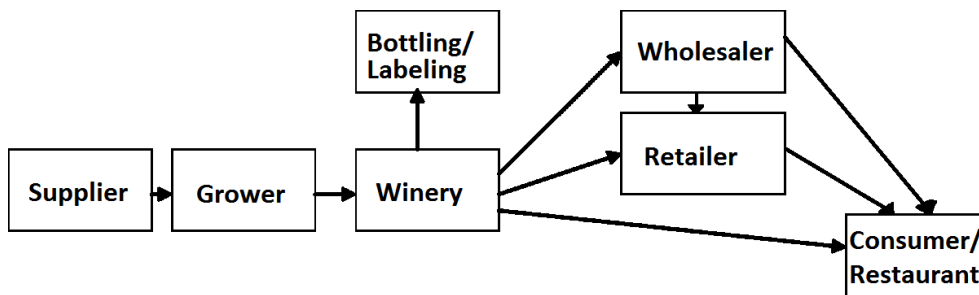
Source: M. van Nierop, 2010

3.4 Value chains of the wine industry

The understanding of the importance of the value chain has been explained in section 2.4, production is fragmented in activities around the globe. The value chain of the wine industry also has complex and disintegrated characteristics. Several stages of production can be distinguished on a vertical dimension, beginning from the grape grower till the retailer. The vertical dimension is the clearest variant to explain the production global process of wine and will be discussed first. Figure 3.20 clarifies the explanation by showing a simplified value chain. Next the horizontal dimension will be put in a context of the wine industry. This section will end with other industries that are diagonal related to the wine industry.

By explaining the value chain in a *vertical* dimension, the suppliers are at the beginning of the value chain. They provide goods like grape stocks and fertilizers to the grape grower. Next the grape grower handles the growth, harvest and delivery of grapes. He is responsible for the amount of quality of the grapes what is crucial for the success of the final product. The third activity, are the acts of the wine producer. Here the grapes are being manufactured into wine products. Different kinds of wine can be produced in this stage, bulk wine, fine wines or grape juice. Bulk wine can be transported in large tanks or containers and distributed to firms who will conserve the wine in cellars and prepare them for sale. This involves packing and labeling the wine into bottles, small boxes or bags. The finished goods are being sold to export distributors and wholesalers. Sometimes the firm also sells the wine directly to retailers, consumers or restaurants, but the biggest percentage goes to the wholesalers and from there to the retailers. Most of the consumers and restaurants buy their wine at the retailer. Apart from this disintegrated explanation of the vertical production process, other more integrated forms are also possible. Wine producers or wineries often take care of the conservation and packing of the wine in order to sell finished goods. The separation of grape grower and wine producer is also not always necessarily true, but it is more common.

Figure 3.20: Vertical simplified value chain of the wine industry



Source: M. van Nierop, 2010, adapted from Aylward & Clements, 2007

The *horizontal* dimension in the wine value chain involves the wineries/wine producers. These firms are part of the core activity of this value chain. They can be located in a cluster where the competition and cooperation between the firms is even bigger.

A lot of other industries have an influence on the wineries and the wine industry as a whole and therefore make part of the value chain. Figure 3.21 shows an example of the California wine cluster and shows all the industries that can be *diagonal* involved in the production of wine. Producers of; winemaking equipment, grape harvesting equipment, barrels, bottles, caps and corks, labels and many others provide the wineries of necessary goods for the production of wine. Universities and research centers are also part of the value chain by delivering knowledge and cooperate with the wineries. This is important to maintain a certain amount of quality and is necessary for the capacity to upgrade. The government can be involved through several government agencies that regulate or coordinate the wine cluster or industry. Other consumer industries like the tourist and the food industry can also be involved the wine cluster, because of the wine tourism and the relevance of food with wine.

Figure 3.21: The California Wine Cluster

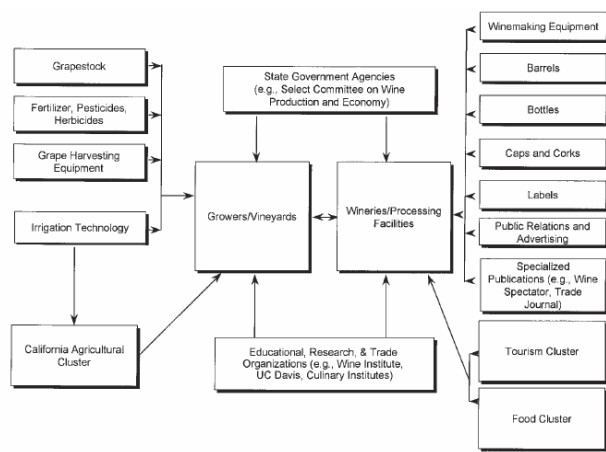


Figure 1: The California Wine Cluster
SOURCE: Based on research by Harvard M.B.A. students R. Alexander, R. Arney, N. Black, E. Frost, and A. Shivananda.

Source: Porter, 2003

3.5 Factors influencing upgrading of wine clusters

In the wine industry, several factors can have an effect on the upgrading of wine clusters. Just like in section 2.6 the factors are divided into *upstream factors*, *downstream factors*, and *the institutional framework*. The *upstream* factors involve activities in the wine producing part of the value chain. This includes the grape grower, the winery and everything evolved in this part of the wine producing process like universities and governmental influence in the producing cluster. The *downstream* factors entail the importers, distributors, retailers and consumers. In other words, everything that has to do with the demand side of the value chain. The pressure they can exert can influence the production process and the products. They determine eventually which wine is most popular amongst the consumers.

This section will give insights off the enabling and constraining factors of upgrading of clusters in value chains of the wine industry. From this discussion a hypothesis will be given that clarify the most important factors that influence upgrading.

Figure 3.22: Labor intensive wine producing



Source: M. van Nierop, 2010

3.5.1 Upstream Factors

The upstream factors in the wine industry are all the actions at firm level, so all activities that involve producing wine. The focus lies on grape producers and Wineries, but most possibilities of upgrading are at the level of wineries. They will notice the biggest benefits or disadvantages of the factors. The most important factors influencing upgrading at the supply side of the value chain are: (I) Proximity, (II) Firm size & coordination, (III) Knowledge base & innovation, (IV) Supply chain deficiencies and (V) Entrepreneurial drive.

Proximity: As discussed in chapter 2, the importance of proximity is significant in the evolutionary economic geography. This also applies in the wine industry. In order to share knowledge, proximity of other firms and universities is crucial and can lead to innovative behavior. But this is a result of another reason why wineries usually are located in the same area. In the wine industry the climate and the quality of the soil is crucial for the quality of the grapes. That is why, in time, some areas became wine areas. So, path dependency plays a crucial role in the location of the wineries and

external factors determined the proximity of these wineries. In some areas the quality of the wine became better. Wineries in that area decided to cooperate with competitors that are located in the same area and created geographical certification. What means that wines from that specific area, guarantee a certain amount of quality. Several forms of proximity contributed to the success of the cooperation between the wineries in the certificated areas. Apart from the geographical proximity, the firms are similar in certain matters, what means that the cognitive, organizational and social proximity are close enough to cooperate with each other. The institutional proximity is also present, usually provided by organizations that monitor the quality of production and products.

Firm size and coordination in a cluster: The size of the winery can have an influence on the ability to upgrade. Larger wineries often have bigger financial buffers to take the risk of innovation. The presence of a larger stock of grapes also creates the opportunity to produce quality wine by selecting the best grapes. In a lot of wine producing countries it is noticeable that larger wineries have an significant part of the market share. They act as leader firms and often determine certain trends and the amount of innovation in a wine industry. Other, smaller firms tend to imitate this behavior and try to lift on the success of these leader firms by cooperating with them. Them puts the bigger firms in a position of coordinator inside a cluster of an entire industry.

Knowledge base and innovation: In order to keep up with the changing and innovating competitors, wineries have to make sure that there is a certain amount of knowledge present in the firm. Customers seem to prefer wine from the New World because of the uniqueness, innovative blending and quality (Aylward, 2003). This gives wineries the chance to profit from this trend by innovating and improve their wine in order to compete at a level with wines from the Old World. The knowledge that is created in a firm is due to the existing stock of knowledge in a cluster. Universities, firms and external sources are play an important role to shape this knowledge base system (Cusmano, 2010). When the wineries are embedded in the local information network, they can benefit from the local knowledge spillovers (Morisson & Rabellotti, 2008).

Entrepreneurial Drive: The wine industry is characterized by the fact that the entrepreneurial drive is an important factor to indicate if a firm will actually upgrade. More than other industries, firms in the wine industry have the choice to upgrade. Expanding the production amount, working more efficiently or more automated is all the choice of the wine producer itself. Many (large) wineries experience the pressure the increasing (international) competition, and demands from consumers, but in a certain way they choose for this pressure by participating in this competitive part of the wine market. Apart from this, many small (family) wineries exist who have no motivation to participate in this market or to upgrade at all. They usually produce a small amount of wine and mostly sell to tourists that visit the area. This phenomenon is present in all wine producing countries, in the new world and old world.

Figure 3.23: Stainless steel wine tanks



Source: M. van Nierop, 2010

3.5.2 Downstream Factors

The wine industry is characterized by the central role the demand side plays in the evolutionary trajectory of this industry (Cusmano et al., 2010). Retailers and distributors have an increasing market power in the value chain. Especially the store chains determine which wine products will be sold in the market. The growing internationalization of the wine market is an important change in the global wine industry, what results in an increasing competitive wine market (Corrado & Odorici, 2009). This affects both wineries and distributors, but distributors can benefit the most of it because they are put in the position of choosing the wine. They can have influence on the wineries because of this power and can have certain demands and put restrictions if they want. In other words, they can influence the upgrading process of the wineries in producing countries. Three main factors can have an influence on upgrading in the demand side: buyer-driven forms, trade-related constraints and entry barriers to non-commodity industries.

Buyer-driven forms: New world producers have upgraded their wines because of the demands of the consumers. The role of the consumer has led to the fact that definition of wine 'quality' is not the exclusive domain of the producers anymore (Cusmano et al., 2010). They produce better quality and respond to the changing tastes of costumers. Due to uniqueness, quality and innovative blending, customers are showing an increasing preference for New World Wines (Aylward, 2003). The changing consumption tastes are part of a transition in consumer attitudes in traditional wine drinking countries and countries with an incipient wine culture (Cusmano et al., 2010). China and Russia are examples of countries with an incipient wine culture with an enormous growing demand. This wine market is increasing due to the rise of the mid-class in these countries.

In most agriculture-based commodity chains, governance structures have shaped into highly asymmetrical buyer-driven forms where downstream actors such as distributors and retailers located in developed markets have increased their market power (Farfan, 2005). This asymmetric value in the global wine chain can be distinguished by four strategic developments. (I) *Consolidation:* The consolidation has a major effect on the competition in the wine market (Gwynne, 2008).

Wine producers across the globe have become highly dependent on large supermarkets (Lagendijk, 2003). Wine is increasingly bought in these supermarkets and at wholesalers, and this has an effect on the market power of these distributors and makes it difficult for small producers to sell their wine in the markets (Cusmano et al., 2010). (II) *Supply chain coordination capabilities*: In the wine industry, distributors have a large market power. Wine shops chains and supermarkets play a very dominant role in the mass consumer attitude, and demand a combination of constant quality and quantity (Lagendijk, 2003), therefore they purchase their wine stock at distributors because they can deliver it to them in a short notice if it is necessary. This gives distributors an enormous market power in the wine industry and prevent producing firms to upgrade functionally. (III) *Branding*: For new producers it is increasingly becoming difficult to compete with big brands in the market. Wine producers of the New World faced the same problem. The large amount of new and small wine producers would not stand a chance to compete with the established names of wine producers of the traditional wine producing countries. California was the first to change this and Australia chose to promote *Brand Australia* (Cusmano et al., 2010). This removed all the 'unimportant' differences between the producers and would stand strong against its competitors.

Entry barriers: In the wine industry, firms are increasingly involved into functional upgrading (Embrapa, 2010). Some firms evolved from delivering grapes into producing wine, others obtained more functions like marketing and distribution. But established names in the wine industry are trying to prevent that new players of the industry are upgrading in this way. Especially distributors have large market power and they are trying to prevent wineries to enter their activity on the value chain (Cusmano et al., 2010).

3.5.3 The Institutional Framework

Policy framework: Economic policies in wine producing countries can play an important role in the degree of commodity dependency of the domestic wineries in the global value chain of the wine industry. Especially countries of the New Wine World tend to have orthodox neoliberal policies which mean that policy makers lack an active intervention on the creation of competitive barriers. These countries miss investments in technology and human resources (Katz, 2004 in Farfan, 2005), this affect the capabilities of the firms in their upgrading processes. The tariff and subsidy agreements are in some cases negative for the wine industry if they are considered as a relatively unimportant industry to the total domestic industry.

Trade-related factors: Import tariffs on wine products in developed countries are made to protect local farmers. Apart from that, high agricultural subsidies will lead to the erosion of profit margins to exporting wineries (Farfan, 2005). In 2009, 43 billion euro was saved for interventions in the agriculture markets; 1.3 billion euro is the part for the wine industry (EC, 2010). Although plans are made to change European subsidies of wine farmers into investments of upgrading the European wineries, today subsidies are protecting the European producers from losing a larger market share to the *new wine world*.

Structural drivers of industrial performance: (I) *Skills:* The presence of skilled employees in the wineries can have a big influence on the upgrading processes. That is why education of the employers is important to improve the quality and efficiency of wine production. In the case of California and Australia it is clear that the presence of universities contributed to the upgrading of their wine market; not only by implementing innovations and technology, but also to provide knowledge for the employees. The presence of universities also creates and attracts a pool of skilled employees, what is good for the evolution of the industry. The presence of other wineries with skilled personal also creates this pool of workers and creates better possibilities that skilled employees will stay in the area because it is easy to switch between companies. In this process of attracting more skilled employees, the area of wineries will become a specialized wine cluster.

(II) *Technological effort:* Support from the government in terms of investments in technology, R&D and science can be very helpful for any ambitions of domestic wineries in their upgrading plans. Governmental institutions can contribute to technological innovation processes and support firms in their limitations. Especially most small firms lack an R&D department or technology centre; this is a part where the government can join in. Any lacks of technological effort from governments are usually solved with external knowledge. Flying winemakers play an important role in the global wine market in diffusing a modern approach of winemaking and the loosening of traditional ways of wine production (Corrado & Odorici, 2009).

(III) *Infrastructure:* The presence of proper infrastructure is crucial for a good development of wine clusters. Distribution of wine is usually done by trucks, so a road connection is crucial to distribute any wine at all. Global wine export is also done by ships, this means that a connections to ports can ease distribution. But the most important aspect of distribution is a good road connection. IT-infrastructure is increasingly becoming important in the wine industry. Internet orders and online trading is increasingly used in this industry.

Figure 3.24: Process upgrading in the wine industry; automated wine producing



Source: M. van Nierop, 2010

Chapter IV

The “Serra Gaúcha” Wine Cluster

4.1 Introduction to the chapter

Just like the countries described in chapter 3, Brazil can also be counted as one of the new world wine countries. This country is producing wine over 100 years now, but serious attempts to produce and export quality wine is a more recent activity. Today Brazil is not really a big player on the international wine market and it is hard for them to compete with other countries like Chile and Argentina who produce their product with similar quality but at lower prices. Recent, plans are made by Ibravin to change this and to put Brazil on the map as an exporter of good quality wines for export. The export manager of Ibravin explained: *But at least as important are the plans to improve the domestic sales. Brazil must become a more wine minded and wine drinking country*’ (Interview, 14-04-2010). These plans will be discussed further in this chapter. Apart from the plans to improve the purchase of wines, this chapter will focus on the production of the wine, what improvements are taking place in this industry and what these improvements are achieving.

The emphasis of this chapter is furthermore on the wine cluster ‘Serra Gaúcha’, that is located in the South of Brazil, North-East in the state Rio Grande do Sul. As can be seen in figure 4.1, the cities Antônio Prado, Bento Gonçalves, Boa Vista do Sul, Canela, Carlos Barbosa, Casca, Caxias do Sul, Cotiporã, Fagundes Varela, Farroupilha, Flores da Cunha, Garibaldi, Guaporé, Gramado, Monte Belo do Sul, Nova Araçá, Nova Bassano, Nova Pádua, Nova Petrópolis, Nova Prata, Nova Roma do Sul, Pinto Bandeira, Protásio Alves, Santa Tereza, Santa Antônio do Palma, São Marcos, Serafina Corrêa, Veranópolis, Vila Flores, and Vista Alegre do Prata belong to the Serra Gaúcha region (Ibravin, 2010). The data is mainly collected through 12 interviews that were taken, a survey among 128 firms and several visits to the area. The reason to narrow down from the total wine industry to a single cluster is that several connections and relations can better be distinguished. Also can be determined how important proximity and cooperation is for the upgrading of an industry. Besides these benefits, a view on the Serra Gaúcha region covers almost the entire wine industry of Brazil because 90% of the Brazilian wine is produced in this cluster.

In chapter 2 we have seen that clusters can be seen geographical concentrations of interconnected firms and institutions of similar or related activities (Porter, 2000). In order to determine if the wineries in the Serra Gaúcha region count as a wine cluster, a measurement of the concentration and connection between the firms is needed. The concentration of the firms can be measured with the *location quotient*. The location quotient measures the actual concentration of the firms in this area compared with the rest of the wineries in the country and all other types of industry. The location quotient of the Serra Gaúcha wine cluster can be calculated as followed:

$(\# \text{ Wineries Serra Gaúcha} / \text{Total} \# \text{ firms Serra Gaúcha}) / (\# \text{ Wineries Brazil} / \text{Total} \# \text{ firms Brazil})$

Location quotient of the Serra Gaúcha wine cluster: $(704 / 52672) / (1200 / 5787566) =$

$0.0134 / 0.00021 = 63.81^5$

⁵ The number of firms in Serra Gaúcha and Brazil are based on figures from ‘Instituto Brasileiro de Geografia e Estatística’ (Brazilian Institute of Geography and Statistics), 2011, and can be found in appendix 3.

4.2 The Serra Gaúcha cluster

The actual history of the Brazilian wines dates back to the sixteenth century, with the colonization by the Portuguese, but it's current development is due primary to the Italian immigrants who came to Brazil in 1875 (Fensterseifer, 2007). Italians and Germans who came to Brazil got a special arrangement from the government to settle in the under populated South. At low costs they would get a piece of land where they could live. The Italians brought grapes and knowledge from their home country and started to produce wine. They settled in several places that are located in the Serra Gaúcha region what later formed a wine cluster. The chief winegrower and CEO of Pizzato Vinhas e Vinhos said; *'There is a close relationship between the Italian heritage and the cluster development. Without the heritage, wine production would probably take place in other regions more suitable for agriculture. But this heritage is also a crucial factor behind the resilience of the wine producers against the comparative disadvantages when compared to Chile, Argentina, Uruguay and others'* (Interview, 24-06-2010).

A lot of farmers started to produce their own wine and became small family firms, passing the knowledge and heritage from father to son. This evolved in a cluster that is located in villages in the Serra Gaúcha region, like Bento Gonçalves and Caxias do Sul. Inside of this cluster, many firms cooperate with each other in order to upgrade in several ways. Some family firms became very big (Miolo) and other remained small but entered in a cooperation (Aurora). The amount of firms that participate in the cooperation Aurora grew exponentially. An export manager of Vinicola Aurora claimed: *'Aurora started with the cooperation of 16 wineries, today 1100 families cooperate with Aurora. Wine production is done here, the only activity of the 1100 families is to deliver grapes'* (Interview, 15-06-2010). Some other firms remained small and traditional, and had no intention to cooperate with organizations or firms, or to upgrade their production. The export coordinator of Salton claimed that: *'Some of the small firms are influenced by the traditional ways of production, this can constrain them for upgrading'* (Interview, 19-06-2010). Cooperation between wineries of the Serra Gaúcha region is a relative recent activity. It started about 15 years ago and mainly focuses on joint marketing to increase export products and to raise domestic consumption. The export manager of Peterlongo claimed. He also mentioned: *'Before this period Brazil was had no real input of technology and knowledge like today and the quality of wine were low. One of the major causes was the lack of finance of Brazilian wineries, nowadays the production is much more focused on quality'* (Interview, 29-07-2010).

Figure 4.2: Vale dos Vinhedos



Source: M. van Nierop, 2010

The heart of the cluster is located in 'Vale dos Vinhedos' (Valley of the vineyards, figure 4.2). This valley is about 30 kilometers of the Capitol of Rio Grande do Sul, Porto Alegre (Figure 4.3). Wines produced in this area have a certification that guarantees a certain amount of quality and proves that the wines are from this region. Traditional production of wine has made room for innovation and improvement in the production of wine. Firms from this area are joint with several organizations that is will contribute to the upgrading of the firms in the cluster. Networks with government, marketing agents, universities and partnerships are present in this cluster to create a dynamic cluster that is constantly trying to be more efficient in production and cooperation. Ibravin is an organization that is trying to increase national and international sales of wine in Brazil. Besides that, it also puts effort to increase the consumption of wine in Brazil.

Figure 4.3: The location of Vale dos Vinhedos

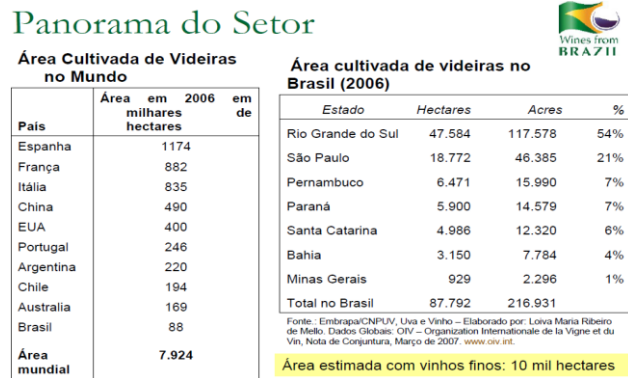


The domestic consumption of wines in Brazil is 1.8 liters per capita. Compared to neighbors, Argentina (40 liters) and Uruguay (33 liters), this is very low (Fensterseifer, 2007). The marketing organization Ibravin wants to overcome this social constraint by changing the wine drinking culture in Brazil. A spokesman of Ibravin claimed: *'One of our targets is to increase the consumption of wine at the dinner table'* (Interview, 14-04-2010). Financial constraints in the Brazilian wine industry are the costs and taxes on wines. The prices of the Brazilian wines are relative high and besides that, 42 per cent of the consumer price is taxes. This is very high compared with Argentina and Chile, where consumers pay approximately half of that. This is very difficult for the Brazilian wine industry in the competition, because Argentina and Chile are the two largest wine exporters to Brazil (Fensterseifer, 2007). In several interviews it became clear that the Brazilian tax system affect the industry in their performance. One interviewed said: *'There is no industrial policy for the long term in Brazil at all. The cumulative tax system make our products so expensive, this affects all Brazilian industries not just the wine industry. Besides that the unbalanced currency exchange rate are detrimental for our industry and is caused by the Brazilian economic policies to control the inflations'* (Interview, 24-06-2010).

In order to overcome these financial constraints, improvement of the production is getting a lot of attention in Brazil, especially in Vale dos Vinhedos. The awareness that other forms of upgrading are also important is positive, but the several constraints make is difficult to really increase the production and exports. Ibravin made a twenty year plan to increase the domestic consumption to a level of 12 liters per capita. There are 1200 wineries in Brazil today, 740 of them are located Rio Grande do Sul (Ibravin, 2010). Although 62% of the Brazilian wineries are located here and they 'only' cover about half of the cultivated wine area of Brazil (see figure 4.4), the wineries in Serra Gaúcha produce 3.2 million hectoliter wine per year, what is about 90% of the total Brazilian wine industry (Vargas, 2001). Compared to the rest of the wine producing countries in the world, the 88.000 hectares of cultivated wine area of Brazil is relative small. The government is trying to improve the industry by investing in organizations like Embrapa and Ibravin. From the interviews it became clear that a lot of firms in Serra Gaúcha made use of the technology of Embrapa and the promotion of Ibravin. The export supervisor of Vinicola Aurora claimed: *'The assistance of the government in the promotion of Brazilian wine is helping a lot. Two years ago the Brazilian embassies started to drink*

and serve Brazilian wine instead of foreign wines. This helps for the international promotion another great initiative of the government was the introduction of the PEP-plan, what stands for Prêmio de Escoamento de Produções. This governmental plan was created to help firms that had a stock of wines that was too big. The government would pay the difference in price, so these wines were subsidized' (Interview, 15-06-2010).

Figure 4.4: Global and Brazilian areas of cultivated wine areas in thousands hectares.



Source: Ibravin, 2010

4.3 The Evolution & Upgrading of the Serra Gaúcha wine cluster

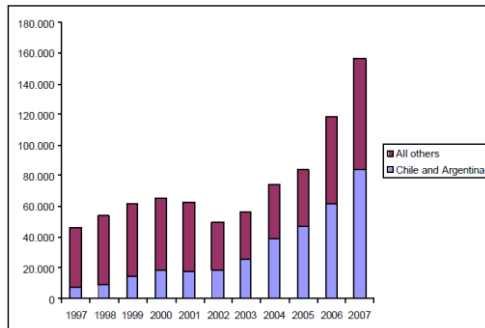
As mentioned before, wine producing in Brazil started with the settlement of the Italian immigrants in 1875 in several villages located in the Serra Gaúcha mountains of Rio Grande do Sul. In the beginning wine was usually produced for own use. From that point on the wineries started to produce wine for the area. The demands for quality and quantity was low, this gave the owners of the wineries no intention to improve their production by any means. The firms were always run as family business, sporadic people were hired as employees, but mostly family members worked in these companies. This continued for a long time, production increased slowly while they started to produce for the rest of Brazil, but no big changes were noticeable. Production for outside of the region Rio Grande do Sul mainly focused on Rio de Janeiro and São Paulo, but was in small amounts because the consumption of wine was not common. In the rest of the country wine was barley sold (Embrapa, 2010). Brazilian wineries only produced bulk wines. These are low quality wines that are sold at a low price.

This remained the economic development of the Brazilian wine industry until the 1990s when the people of Brazil started to consume more wine. The first movement noticeable in Brazil was that the consumption of wine increased. Especially the upper class started to drink wine and they preferred foreign wines from France and Italy instead of the low quality bulk wines of Brazil. The major wine consuming market in Brazil was found in the state São Paulo, which still accounts for 50% of the national consumption, followed by Rio Grande do Sul with a national consumption of 30% (Vargas, 2001).

With the rise of the New World countries, countries in South America started to produce quality wine. It became easier to import large amounts of wine from producing countries in the proximity than countries overseas, but the traditional countries stayed popular. At this time, the surrounding countries Chile and Argentina had a lead in the production of quality wines, so a instead of a shift from European wines to Brazilian wines, Brazilian consumers started to drink Chilean and

Argentinean wines. Even today, the Brazilian wines have a bad reputation compared to these two countries. Chile and Argentina are becoming increasingly important as the main importer of wine in Brazil (figure 4.5). But partly at that time Brazil did not produce much wine.

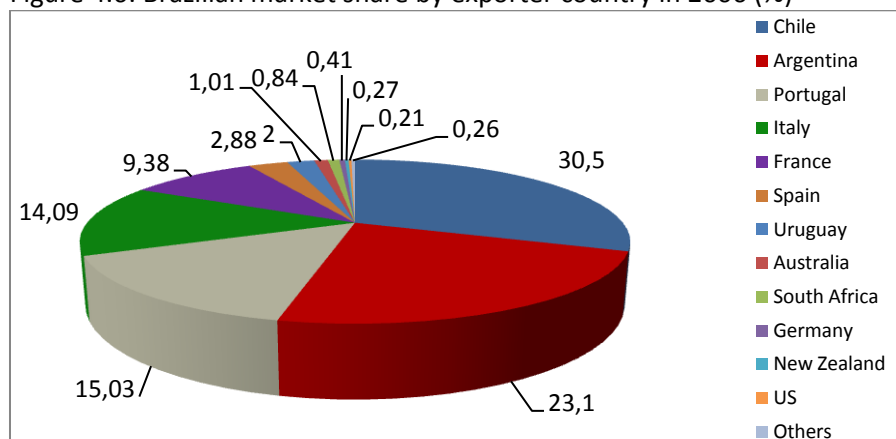
Figure 4.5: Wine imports in 2006 (in Millions US\$)



Source: M. van Nierop, 2010, adapted from: Brazilian Secretariat of Foreign Trade (SECEX) in Perkins, 2008

Figure 4.5 shows a clear increase in the wine imports in the period 1997 till 2007. An increase of wine imports from 43 million US Dollars in 1997 to 158 million US Dollars in 2007 where the import of Chile and Argentina was about 1/10 part of all import value in 1997. Ten years later, in 2007, more than half of all value of the imported wines came from Chile and Argentina (Secex, 2008). Figure 4.6 shows a clearer image of the Brazilian market share by exporter countries. Besides Chile and Argentina, Portugal, Italy and France are the main suppliers of the Brazilian wine market. In 2006 Brazil imported 45.3 million liters wine. Over the years, Chilean wines became the most imported in the Brazilian wine market with a market share of 30.5% of the foreign wines. Argentina also has a significant part with 23.1%. Remarkable is that Portugal is the third largest exporter of wine in Brazil instead of France that is usually the biggest exporter from Europe. The reason for this large market share is the linguistic relatedness (Ibravin, 2010), the language barrier still plays an important role in the Brazilian wine industry and therefore similarity in language is desirable for doing business. Portugal is followed by Italy as largest exporter to the Brazilian wine market. This could be the result of the Brazilian wine-industry's historical ties through the Italian Diaspora. This connection has its effect in many ways in the wine industry through several wine courses and seminars for Brazilians given in Italy and could also be the reason for this large market share in the Brazilian wine market.

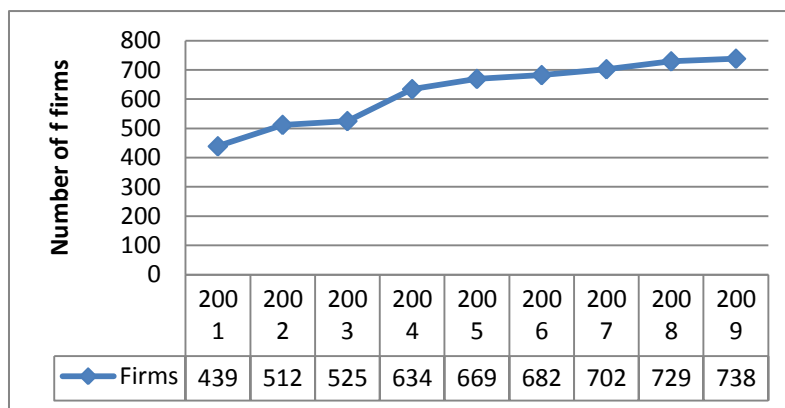
Figure 4.6: Brazilian market share by exporter country in 2006 (%)



Source: M. van Nierop, 2010, adapted from: Brazilian Secretariat of Foreign Trade (SECEX) in Perkins, 2008

Apart from all the imports, the wineries in Serra Gaúcha are producing wine as well and have increasingly domestic and international sales. Today Rio Grande do Sul has 579 wineries, having vines on nearly 40 000 hectares land. With a total grape production of 493 million kilos, the overall wine production accounted for 325 million liters in 2006 (Ibravin, 2010). The number of wineries in Rio Grande do Sul grew from 439 in 2001 to 738 in 2009 (figure 4.7). Ibravin made plans to expand this amount for export as for domestic sales even more. Most of the wineries are small family firms, but a very small amount; like Miolo, Salton, Aurora, Casa Valduga and Peterlongo are very large, compared to the rest and have the biggest market share.

Figure 4.7: Evolution of the number of wineries in Rio Grande do Sul

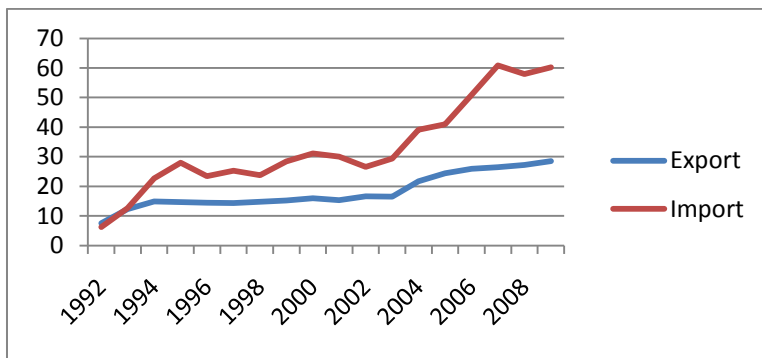


Source: M. van Nierop, 2010, adapted from: Ibravin, 2010.

Most of the wine is consumed in the states São Paulo and Rio de Janeiro, together they account for 50% of the wine consumption, a spokesman of Embrapa explained. He mentioned that most wine is consumed in the winter months, in Brazil from May to September. And because the wine consumer in Brazil still lack a certain wine knowledge, brand naming is important for consumers. Famous wine areas or big brands usually sell better than unknown wine labels. This is one of the reasons why the wineries in Vale dos Vinhedos today have a certification that guarantees a certain amount of quality. An export manager of an interviewed winery explained: *Since our wines have the certification, our turnover rose for domestic sales as for international sales. But it is still very hard to establish in the wine market (Interview, 24-06-2010).*

An important constraint in upgrading for the companies is the competitive wine market. The wineries have a lot of difficulty accessing markets and gain a part of the market share. Especially the international market is very competitive. In the domestic market, foreign wines are a big competitor for the Brazilian wines. As can be seen in figure 4.8, although the export of Brazilian wines is increasing, the Brazilian wine market is increasingly importing wines from other countries. So Brazil is producing more wine, but is also importing more wine from other countries.

Figure 4.8: Brazilian Wine Exports and Imports (millions of liters)



Source: M. van Nierop; adapted from Ibravin 2010, Vargas, 2001

Just like in chapter 2 is described, the consolidation is also noticeable in the Brazilian wine market. Retailers and distributors have an enormous market share and this only seems to increase. Of all imported wines in Brazil, the supermarkets and wholesalers account for 70%. Hotels and restaurants take 20% of this share and shops account for the remaining 10%. The market power of distributors is less overwhelming, 57% is imported through distributors and 43% is bought directly from the supplier (Secex, 2008). Although the imports are still growing, Brazil has a lot more potential for the wine industry with its 190 million residents. For this reason a lot of countries are following the wine drinking habits of Brazil and try to gain an even bigger market share. But the wineries in Brazil are trying in cooperation with several organizations like Embrapa and Ibravin to win back this part and even become a net exporter of wine.

In order to accomplish that, the wineries have to overcome several constraints, like the high taxes. Brazil has a very unfavorable tax climate for the wine industry. The firms claim that they have to pay a lot of taxes, unlike wines from Chile for example where no import tax is paid. In Brazil 42% of the price of wine is a tax (Fensterseifer, 2007). This is due to a deal between the Brazilian and the Chilean government. The effect is that the Brazilian wine is more expensive than the wine from Chile. This creates difficulties in the competitiveness of Brazilian wine companies.

Figure 4.9: Wine fields in Serra Gaúcha



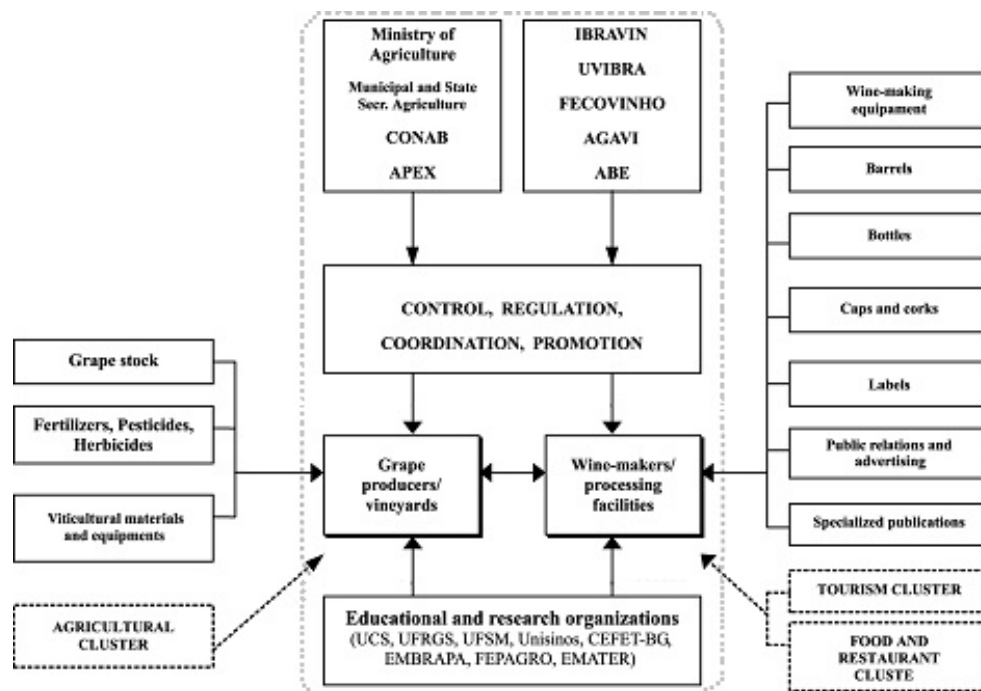
Source: M. van Nierop, 2010

4.4 The Value Chain of the Serra Gaúcha wine cluster

The value chain of the wine industry of Brazil has a complicated structure of a variety of firms and institutions from different industries. In this section the value chain will be discussed in the three dimensions, vertical, horizontal and diagonal. Figure 4.10 shows a model of the Serra Gaúcha wine cluster, it also gives a clear image of the value chain of this cluster.

The vertical dimension of the wine value chain of Serra Gaúcha starts with the providers of grape stock, fertilizers, pesticides and herbicides to the grape growers. This region has a lot of small vineyards owned by several family firms and only delivers grapes to large wine making facilities or cooperation firms like Aurora. Other firms like Lidio Carraro take fully care of the grape production itself. The export manager of Lidio Carraro said: *'The reason for this is that we want to control the quality of the grapes and not be depended on other firms'* (Interview, 24-06-2010). Another variant, as can be seen at Miolo, is that most of the grapes (80%) is from own vineyards and the remaining 20% is bought from other vineyards. The export and import manager of Miolo said: *'Miolo is a winery that started to produce wine from 1994. Before that, from 1889, we only produced grapes'* (Interview, 29-06-2010). So from 1994 they had a functional upgrade and obtained a larger market share by doing that. Most of the large firms of the Serra Gaúcha region handle their packing and labeling themselves. Even some smaller firms like Pizzato take care of this activity. Because of the small amount of production, the firm owner claims that it is financially better to do it by hand than implement machinery to do this job. Due to the advent of tourism, many of the interviewed firms claim that about 10% of their sales is direct sales at the winery. The largest amount however goes to wholesalers and retailers. The retailers are in this case supermarkets, and the biggest supermarkets have an increasing market power due to their large purchases. Wineries in Brazil tend to get reliant of these supermarkets.

Figure 4.10: The Serra Gaúcha wine cluster



Source: M. van Nierop, adapted from Porter (1998) and Fensterseifer et al. (2002)

The horizontal dimension involves all the wineries of the cluster. Most of the firms claim that there is cooperation at some level, but most of it is limited to the export department. Sharing of knowledge is more due to governmental institutions like Embrapa and Ibravin than the initiative of the firms itself.

These institutions play an important role in the governance of the cluster and are part of the diagonal dimension. Universities like Unisinos (figure 4.11), UFRGS and others are involved in the input of knowledge to the cluster. Embrapa also plays an important role in this part of the cluster, because they do a lot of research that will help to overcome certain constraints that firms can encounter. Embrapa self claims that due to the climate and insects a lot of research is done to make sure that the production of wine stays possible in Brazil. The research centre offers knowledge and cooperates with the firms to get the best result.

Figure 4.11: University Unisinos



Source: M. van Nierop, 2010

4.5 Enabling and constraining factors in upgrading the Serra Gaúcha wine cluster.

As seen in chapter 2, several factors can enable or constrain upgrading in a cluster. These factors also had an effect on the upgrading of the firms in the Serra Gaúcha cluster. In this section we will discuss these factors and their effect in the Brazilian wine cluster. By using information from interviews done by several firms and wine organizations in Serra Gaúcha, and the survey among 128 wineries in the region, this section will give insights in the Brazilian wine industry and the effects of the factors in the cluster. In this section only the upstream factors will be discussed because this is the focus of the research. The institutional framework will also be discussed.

The Serra Gaúcha wine cluster has made small upgrading processes since the 1970s (Vargas, 2001). Large firms were able to absorb the necessary technological changes. Although some companies made some improvements, the main focus was on the domestic market and the low quality bulk wine. A stable wine production was noticeable and no real intention for growth or export was present (Vargas, 2001). First real intentions to upgrade were made from the end of the 1990s. A spokesman of Casa Valduga claimed; *'At our company, about 10 years ago a big change in production occurred, an introduction of a style of wines meant less quantity and more quality'* (Interview, 14-06-2010).

In 2005 Giuliani, Pietrobelli & Rabelloti made a research about upgrading in clusters in several industries and countries. They came to the conclusion that the Serra Gaúcha wine cluster had high indications of product and process upgrading (figure 4.12). The survey shows the same figures about

process upgrading. 89% of the questioned firms claimed that they introduced new or improved wine-making techniques (*e.g. fermentation, clarification, micro-oxygenation, etc.*) in the last 3 years. About half of them (53%) undertook any kinds of experimentations like barrel testing and clone selection. Most of these experiments were conducted with third parties. Embrapa, Coatec, Tec. Em Enologia and the University UFRLS were mentioned as some of these parties. In product upgrading, the survey also showed similar outcomes, 72% of the questioned firms claimed to conduct a form of product upgrading in the last 5 years. Most of the activities consisted of improvement of the quality of the products (48.6%) and the development of new lines of products in the traditional market segment (34.3%).

Figure 4.12: Upgrading in clusters, 3 = high; 2 = medium; 1 = low; 0 = absent.

	Location	Degree of CE	Product upgrading	Process upgrading	Functional upgrading	Intersectoral upgrading	Sum of upgrading
Tobacco	Rio Pardo, RGS (Br.)	Medium	3	3	0	0	6
Wine	Colchagua (Ch.)	Medium	3	3	0	0	6
Wine	Serra Gaúcha, RGS (Br.)	Medium	3	3	0	0	6
Sugar	Valle del Cauca (Co.)	High	3	3	2	1	9
Marble	ES (Br.)	Medium	2	2	0	0	4
Copper	Cuajone-Toquepala (Pe.)	Low	2	2	0	1	5
Salmon	Region Austral (Ch.)	High	3	3	2	2	10
Milkdairy	Boaco, Chontales (Nic.)	Medium	2	2	2	0	6
Mangoes, grapes	Petrolina-Juazeiro (Br.)	High	3	3	0	0	6
Melons	Rio Grande Norte (Br.)	Medium	2	1	0	0	3
Apples	Santa Catarina (Br.)	High	3	3	0	0	6
Total			29	28	6	4	
Average			2.64	2.55	0.55	0.6	6.09

Source: Giuliani, Pietrobelli & Rabellotti, 2005

No functional upgrading activities were described in figure 4.12 by Giuliani, Pietrobelli and Rabellotti in 2005. However, from the survey of this research it became clear that the firms claimed that they surely made efforts in functional upgrading in the last 5 years. In the question what activity they perform now that they did not do 5 years ago, *marketing activities* were mentioned most frequently. Apart from marketing, *brand naming* was also mentioned as a form of functional upgrading. So, with the activities present in Serra Gaúcha today, functional upgrading probably occurred more often in the last 10 years. No intersectoral forms of upgrading were noticed in the work of Giuliani et al (2005) and none were found in this research of 2010. Some wineries are selling other products apart from wine, but these are more for touristic purchases. The main product was and still is wine. None of the interviews or surveyed wineries acquired a function to move into a new sector or value chain.

From a full range of several factors (see appendix I & II), the questioned firms were asked which 3 factors had the most influence in their upgrading processes. A big variety of answers were given, but some of them were clearly mentioned more frequently. The factors *keeping up with the changing market* and *willingness to upgrade* were mentioned most frequently in the enabling factors of upgrading. The presence of *Embrapa* and *the access to technology* were also mentioned often. For the factors that constrained upgrading, *the increasing competition in national markets* was mentioned most often. *Difficulty accessing markets, the lack of financial resources and the tax climate of Brazil* were also factors that play an important role by many winemaking firms. Especially from the interviews the tax climate of Brazil was mentioned very often as an important constraint to upgrade.

4.5.1 Upstream Factors

All the activities of the wineries in Serra Gaúcha can be considered as the upstream part in the value chain of the Brazilian wine industry. The most important factors influencing upgrading of Brazilian wineries at the supply side of the value chain are: (I) Proximity, (II) Firm size & coordination, (III) Knowledge base & innovation, (IV) Supply chain deficiencies and (V) Entrepreneurial drive.

Proximity: The importance of proximity is clearly shown in this wine cluster. Especially in terms of cooperation, the forms of proximity are reflected through the presence of several factors. Several representatives of the wineries in Serra Gaúcha claimed that proximity is very important for them. One of them said in an interview: *'Proximity is very important, we often change ideas and work together. Although cooperation between firms is mostly limited to the export departments of the firms, it has shown that there is a lot of interaction in this section. Every 2 weeks we have meetings, what contributes to the amount of trust among the wineries what is very important for cooperation'* (Interview, 14-06-2010). Because most of the interaction between the firms is based on the export department, the organizational proximity is quite solid. They all work in a similar way and have the same goals. This brings them on an organizational level together.

Most of the employees in the import/export department are about the same age, have formal (weekly meetings) and informal (contact outside work) meetings, and know each other well. This reflects a social proximity between the firms. This is closely related to the cognitive proximity because a lot of these employees have the same background before working in this department of the wine industry. Because the export of wine is relatively new in Brazil, many employees previously worked in another industry in the export department. Most of them worked in the furniture industry, because of the presence of a furniture cluster in Serra Gaúcha. When the wine companies started to export wine, some employees switched to this industry. Having a similar background, the employees from the several firms have no problems to communicate with each other, several interviewed claimed.

Figure 4.13: Governmental project: Wines from Brazil



Most of the cooperation between the export departments of the firms is mainly based on the initiative of Ibravin. This organization was created to promote the Brazilian wine industry internationally. One interviewed claimed: *'Ibravin organizes everything for cooperation and export, they also provide information and stands on international wine fairs where we as Brazilian wine firms can participate'* (Interview, 29-06-2010). They also bring the firms together to present themselves as *Wines from Brazil* (figure 4.13) instead of going international individually. The weekly meetings are also organized by Ibravin. These meetings are important to give input about the wine fairs and to agree which company will visit which wine fair. So the institutional proximity in the Serra Gaúcha wine cluster is mainly based on the efforts of Ibravin. Ibravin also organizes the project Vinhos do Brasil (figure 4.14) what is made to increase the domestic sales. Most of the interviewed representatives claimed that both projects were very important in the domestic and international sales.

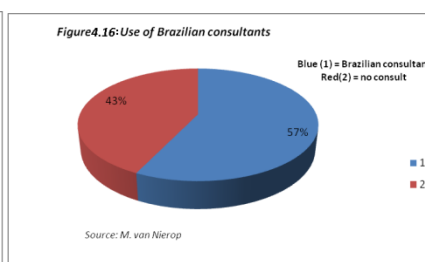
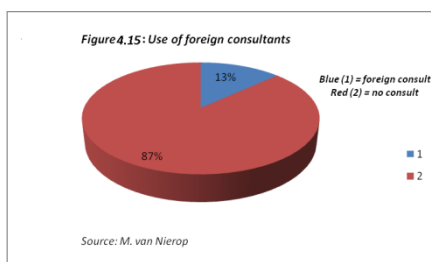
Figure 4.14: Governmental project: Vinhos do Brasil



As discussed earlier, geographical proximity is an important factor in the upgrading process of the firms. In order to transmit tacit knowledge, temporary or permanent proximity is needed. Temporary proximity is created when the wine firms participate in international wine fairs or when they hire external consultants. Foreign advisors play a similarly important role in the Brazilian wine cluster (Vargas, 2001). These consultants are occasionally foreign wine experts and are called *flying winemakers*. They have expertise in upgrading firms in the wine industry and can be hired by one or more firms to help in improving the production of wine. The knowledge they bring is not codified, it is not like a manual how to grow your grapes properly that can be sent by mail or telephone. It is tacit knowledge that can only be transmitted face-to-face, the firms learn by seeing and doing. The survey had shown that the questioned firms claim that foreign consultants are hardly consulted. Only 13% make use of these flying winemakers (figure 4.15). It appears that larger firms make more often use of flying winemakers than smaller wineries. The flying winemakers that do come to the Serra Gaúcha wine cluster mostly come from; France, Italy and some of the USA.

The benefits that arise in the cluster are due to permanent proximity. The knowledge that is shared between the firms in the Serra Gaúcha cluster is based on trust. The weekly formal and informal meetings contribute to the social bonding that arises between the employees of the several firms. Apart from knowledge that is shared, the social bonding also creates cooperation on other levels. Suppliers and customers are, to some extent, shared and passed on between the companies. The proximity of research institutes like universities and governmental institutions could also play an important role in the availability of knowledge. In Brazil, the presence of Embrapa seemed very important for the access to technology and knowledge, 57% of the questioned claim to make use of Brazilian consultants like Embrapa (figure 4.16). Interviewed also claimed that the Universities Unisinos and UFRGS have an influence on the availability of knowledge and technology.

Firm size and coordination in Serra Gaúcha: The Brazilian wine cluster in Serra Gaúcha is characterized by a lot of small family companies. The survey has shown that small family companies and starting companies have shown that the lack of financial resources is one of the most important factors that stand in the way of upgrading and obtaining the benefits of economies of scale. They are not able to invest in new machinery and technology and have trouble updating their production process. The larger companies did not indicate this as a major constraint. Where family firms improvise to reduce the obstacles, to make sure the entire family is working for the firm instead of outsourcing parts like bigger companies do. The consequence is that that the larger firms have more often employees with certain qualifications like a Bachelor, Master or PhD degree in viticulture or oenology the survey showed. Smaller firms mainly claim to have other degrees in viticulture or oenology or bachelor degrees like Business Administration, Management, Marketing and others.



One problem Serra Gaúcha is facing is the limited availability of land. Since the wine business started to grow in Brazil, the wine cluster expands rapidly causing the land reaching its limits. One of the interviewed companies claimed: *'Sometimes firms search for land outside the cluster in order to produce more wine, just like our winery. But our technological office stays in Serra Gaúcha because there is a lot of knowledge and technology present here'* (Interview, 24-06-2010). So some wineries deal with this constraint by expanding to other regions, but the survey shows that not a lot of wineries see the limitation of land as a constraint in their upgrading process. Probably because a lack of financial resources is indicated as one of the mayor constraints in a lot of wineries, they do not even have the possibility to expand to other regions. Larger firms in the area like the Miolo Wine Group (figure 4.17), are one of the few companies who has the possibility to take this action and has wineries all over Brazil. This creates options to a rational choice about a better place without being bounded to a certain location. So cheaper locations are chosen with room to expand, a better climate, good soil and less trouble with insects. Another option to expand is to outsource the grape production to other companies. A lot of wineries already outsource parts of the grape production. Only 35% of the wineries use 100% of their own grapes, 65% outsources parts of this activity. Usually it this evolves in the range between 20 till 40% of the grapes that is outsourced.

Figure 4.17: Vinicola Miolo



Source: M. van Nierop, 2010

Knowledge base and innovation: The governmental institution Embrapa facilitates a lot of knowledge in their research centre. Here, they work on new technologies to improve the wine production. A lot of wineries make use of the technology of Embrapa and implement this in their production process. A lot of firms have argued that the research done at Embrapa is crucial for their upgrading processes.

Apart from Embrapa, surrounding universities like Unisinos and UFRLS also give access to technology. These universities do research for the wine industry, but more importantly they facilitate places to educate the employees of the firms. These universities are located in the Serra Gaúcha region. Other universities that do research about the wine industry are not necessarily located in this region.

The bigger firms in the cluster like Miolo, Salton Aurora and Casa Valduga have their own research centre. They also make use of the technology of Embrapa and the universities but also create their own technology. Other firms do not have access to this technology because the bigger firms keep this knowledge to themselves. These bigger companies can however not be regarded as leader firms as described in chapter 2. Although they have a bigger market share, they do not show any behavior of a leader firm. The motivation for the smaller firms to upgrade lies more in the demands of costumers and the technology provided by Embrapa than it is the power of the bigger firms.

The knowledge that firms have, apart from the knowledge of the core activity, varies in the Brazilian wineries. It is not a surprise that the bigger firms have more capabilities to give activities like marketing more attention. But fortunately institutions like Ibravin help the firms with the marketing activities. They help in promoting their products, and keep track of changes in the market. A spokesman of Ibravin claimed: *'A goal of Ibravin is to enhance the wine consumption in Brazil. One way to attempt this is to make sure that TV actors drink Brazilian wine instead of Chilean wine in Soap operas and TV shows. This results in a change in purchase of Brazilian wine consumers'* (Interview, 14-04-2010). Apart from the promotion of Ibravin, wineries try to reach a broad audience by selling from serious top class wine to wines that are interesting for tourists. An example can be seen in figure 4.18; Vinicola Peterlongo is selling a full range of different champagnes, from top end to champagnes that carry the names of popular football clubs of Rio Grande do Sul.

Figure 4.18: Marketing in Wine, Champagne of famous football clubs



Source: M. van Nierop, 2010

Entrepreneurial drive: An important constraining factor to upgrade for Brazilian wineries is the willingness to upgrade. Especially family companies tend to have a lack in their motivation to improve quality, efficiency and profit. There can be several reasons for this behavior as can be seen in chapter 2. Avoiding risks is one factor and one way to accomplish that is to stick to certain routines. In Serra Gaúcha this kind of behavior is noticeable at small companies. They see no reason to invest in upgrading processes because the current state of work is treats them quite well and provides them enough profit to survive. Therefore they stick to the routines and give very little room for change.

Some companies are stimulated by institutions like Embrapa or Ibravin. Research and promotion done at these institutions give a clear view of alternative ways to handle the wine industry. Some firms get inspired by this and are convinced to improve. Other firms have shown that the market or buyers demand for a better quality of the wine, this stimulates firms to upgrade. International awards motivate them to keep a high quality as a standard and contributes to the willingness to keep the standard high.

4.3.2 The Institutional framework:

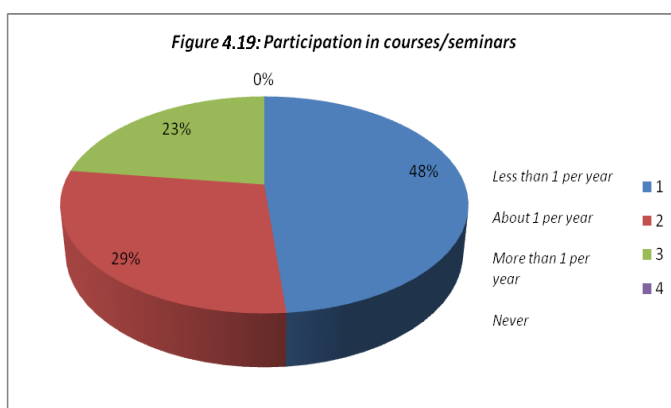
Policy framework: The policy framework in Brazil is not in favor of the wine industry. Although the government supports the wine industry with subsidies for promotion of the wine to increase the domestic consumption and is involved with promotion action for a higher export, the government has high taxes on the wine industry. Because of that, the Brazilian wine is very expensive. So it is very hard for the local wine producers to compete with other countries because of the price of the Brazilian wine. This is mainly because of the tax climate in Brazil.

Trade related factors: The national wine industry is not top priority for the Brazilian government. They have agreements with other countries that are not in beneficial for their own wine industry. A lot of the wineries interviewed claimed that the government has an import/export agreement with Chile. Industrial goods produced in Brazil can be exported into Chile without paying taxes. In return, Chile can export its wine into Brazil without having to pay taxes. The industrial goods production industry in Brazil is more important than the relatively small wine industry, and the wine industry in Chile is important. This affects the competitiveness for the Brazilian wineries in the domestic market, with a constant lower price of Chilean wine and similar quality, it is very hard to compete with wine from Chile.

Structural drivers of industrial performance:

(I) Skills (education): A lot of firms in the region are family companies. Family members grew up with the firm and learned the skills by doing it along the years of growing up. When reaching an age of becoming a serious employee, the family member has already got years of experience in the business. Still it is beneficial for the family members to get a degree in oenology in order to achieve certain skills. This is important if the company wants to improve their production process. Because the wine industry is relatively young, other employees often are transferred from other industries. This has the effect that these employees are not skilled enough. The survey showed that a lot of wineries have no employees with degrees in oenology and viticulture. Firms try to overcome this by provide them education, training and letting them participate in several courses. In figure 4.19 it can be seen that nobody claimed that employees never participated in courses or seminars. Most of them (48%) only do this less than 1 per year, but the other half (52%) lets it employees participate in courses or seminars about once a year of more often.

With hiring (national or international) external consultants, firms also try to improve the skills of their staff. Some firms have indicated that finding skilled employees is difficult. So the benefits from the presence of a large pool of skilled employees do not yet count for this cluster.



(II) *Technical effort*: With the increasing economy of Brazil, the investments in technology also get bigger (The Economist, 2010). Embrapa is receiving more funds from the Brazilian government in which they can do more research and involve more Universities with the improvement of the wine industry. Many wineries claim that they are making use of research done at Embrapa or are working together with them to achieve more and better R&D. It seems that the trend in Latin-America is that technology is increasingly imported. In the wine industry it is measured from interviews and the survey that upgraded machinery is mostly imported from France, Italy and California. External consultants, or flying winemakers are also forms of imported technology, but the Brazilian wine industry is trying to increase the domestic technology by making more use of research institutes like Embrapa (figure 4.20).

Figure 4.20: Research at Embrapa



Source: M. van Nierop, 2010

(III) *Infrastructure*: The Serra Gaúcha area is about a 2.5 hour drive from the Rio Grande do Sul' state capital Porto Alegre. Although the road doesn't seem to be in its best shape due to holes in the road and the ascending/descending angle of the mountain roads, most of the firms claim that the infrastructure is well and provides enough access to the market. And the distance to larger cities like Porto Alegre (2.5 hours), São Paulo (14 hours) and Rio de Janeiro (20 hours) does not have any effect on their performance. The proximity of the most important governmental institutions, universities and other wine companies are far more important than the fast and easy connection with large cities.

According to the firms the IT-infrastructure is also sufficient present in Serra Gaúcha. All the companies are well digitally connected and reachable by phone, fax and internet. A lot of companies also provide the possibility to purchase the products online. The last two years many things have changed on this area and companies started to upgrade their digital accessibility.

Chapter V

Conclusions and Recommendations

5.1 Conclusions

In this final chapter the conclusions will be drawn regarding this research on the upgrading in the Brazilian wine cluster Serra Gaúcha. This study is written from an evolutionary economic geographic perspective and is a combination of a theoretical and empirical research. In the theoretical quest, several theories were described which were most useful to explain the evolutionary economic geography in relation to the cluster and value chain theories. The concept *upgrading* was used in an evolutionary economic geographical view, and several concepts from this theory were used to define upgrading. In section 2.5 a definition of Humphrey & Schmitz (2002) was used to explain upgrading; Upgrading is regarded as the capacity to change their routines (innovate or imitate), and with that obtain more value added in their products and processes. Concepts of the evolutionary economic geography were used to define upgrading.

So upgrading is the ability of firms to change their routines in order to see opportunities to apply technological change (innovations or imitations) that will lead to the improvement of the activities of firms, and having certain absorptive capacities to learn from interactions with other firms or institutes. The firms will learn the most when the cognitive distance is not too far to be understandable and not too close to gain new insights and avoid lock-in. This is stimulated when firms are in spatial proximity of each other, like a cluster, or when they maintain external linkages with other sources of knowledge, and act like global pipelines.

From the empirical study, it has been shown that path dependency can affect the amount of upgrading of a firm or cluster. The history of Serra Gaúcha was the reason for the location of the wineries in the region, but it even has its effect today. Because of the Italian roots, firms feel connected with a high level of trust. This enhances interconnection between firms within the cluster and creates opportunities for upgrading of the firms and the cluster as a whole. So in a certain way, upgrading can be seen as a form of evolution, because it uses several concepts from the evolutionary economic geography to determine the amount of upgrading, and is strengthened by cluster theories because of the importance of proximity. This connects the evolutionary economic geography with the concept upgrading and the cluster theory.

Several factors were described that could influence upgrading of clusters in value chains. These theories and factors were used in theoretical studies in composition of interviews, a survey and observations of the empirical research, a research strategy called triangulation. This strategy was used to increase the validity and assisted the author in his research by providing insights from different methodological approaches in the matter. This study consisted of a main research question:

Which factors constrain and enable the process of upgrading the Brazilian wine cluster within global value chains?

In order to answer this complex question, the main research question is divided into three sub-questions on which this chapter will provide the answers.

1. *How do clusters evolve and what factors constrain and enable upgrading of firms in clusters?*

The evolutionary economic geography, where this study is based upon, emphasizes the importance of innovations and learning that are provided by geographical proximity. These ideas form the core of cluster theories and much older agglomeration economics. Marshall argued that external economies were important for the location choice of a firm because of three reasons. Concentrated areas; (I) create a pool of skilled employees, (II) can support the production of non-tradable specialized inputs, (III) create knowledge spillovers (Krugman, 1991). Cluster theories are derived from the agglomeration economics and became the standard for explaining geographic concentrated economies. Porter (2000) defines clusters as geographic concentrations of interconnected companies and associated institutions. The most well known cluster is the Silicon Valley cluster in California, USA. Clusters can create an innovative environment and benefits such as knowledge spillovers, the increase in productivity, spin-offs, sharing of tacit knowledge can arise from it. Negative effects such as lock-in and high entry barriers can also occur in a cluster.

This study pointed out several factors that constrain and enable upgrading of clusters in value chains. The list of factors is not directly adopted from the existing literature, because such a list does not exist. The factors are derived from several articles and studies concerning similar research and from own interpretations. A selection is made of the most relevant factors to prevent that the list of factors will become infinite. These factors are described in detail in section 2.6 and divided into three sets of factors; *upstream factors*, *downstream factors* and the *institutional framework*. In this section, the factors will be briefly described in order to give a clear overview and to answer the research question. The *upstream* factors are concentrated on the actions at the beginning of the value chain and are located in the producing countries. Factors are divided in (I) proximity, (II) firm size & coordination, (III) knowledge base & innovation, and (IV) entrepreneurial drive. The *downstream* factors involve all the activities that are carried out by global firms in developed countries such as retailing, trading and marketing. The factors on the downstream level are divided by (I) buyer-driven forms and (II) entry barriers. The *institutional framework* involves the laws and regulations that can affect upgrading processes and its factors are divided by (I) the policy framework, (II) trade-related constraints, and (III) structural drivers of industrial performance. Figure 2.8 gives an overview of these factors with an addition of several measurable variables.

2. *How has the global wine-industry evolved and what are the factors affecting upgrading in the wine-industry?*

The global wine market has shown a remarkable transformation, were the wine market was originally dominated by traditional wine producing countries like France, Italy and Spain (Old World), a shift is noticeable towards relative new players in the market. Countries like Chili, South Africa and the state of California are called the New World and they tend to take over the global wine market. Consumers seem to appreciate the new and innovating ways of wine production. Countries from the New World seem to compete with the traditional countries by investing in improvement of production and products. Several success stories are described in chapter 3 were different kinds of upgrading are implemented and caused the domestic wine market to flourish.

In this chapter it also becomes clear that the factors that influence upgrading described in chapter 2 are applicable in the wine industry. In the upstream factors, location and proximity are important for upgrading and are often affected by path dependency. Firm size, investment in knowledge and innovation were crucial for some success stories of new world countries that entered the global wine market. In the downstream factors it becomes clear that distributors and retailers play a dominant role in the wine market. The institutional framework shows that governmental investments in technology or education are very important for new firms to help conquer the global wine market, and subsidies to assist domestic firms in protecting local markets from foreign firms.

3. *How has the Brazilian wine cluster evolved over time and what factors enable or constrain upgrading?*

The reason that the Serra Gaúcha area became the wine producing hotspot of Brazil is not only because it has the best facilities or the best climate in Brazil, but as a result of its historical background. In 1875 Italian immigrants settled in this area and imported skills to produce wine from their motherland. From that moment, Brazil started to produce wine and that evolved into the current wine cluster. This proves that companies don't always choose the optimal location to start their company, because other factors have also got a big influence. Moreover, *the optimal location* does not exist according to the evolutionary economic geography. In this case, path dependency had a big role on the location choice of the wineries to start producing. From this location, the cluster started to grow and today it finds itself in a position of irreversibility. This corresponds with the Evolutionary Economic Geography discussed in chapter 2.

In the Serra Gaúcha cluster both positive and negative effects are noticeable. Most real cooperation is limited to the export departments. Ideas about joint investments and shared purchase or transport occur sporadically. Cooperation between 36 firms have led to the rise of the organization Ibravin who deals with all marketing issues and is a great help in accessing the global wine market. The certification of the Vale dos Vinhedos label also is a form of cooperation that has led to an increase in sales. The negative sides of this cluster are that many firms are locked-in their traditional routines of wine producing and are not open for innovation and change. Also the availability of land is running out so room for expansion is limited.

Not all enabling and constraining factors described in chapter 2 influence upgrading of clusters in the wine industry in general and the Serra Gaúcha wine cluster in Brazil in particular. In chapter 4.5 the factors concerning the Serra Gaúcha wine cluster were extensively described and the focus lies only on the upstream factors and the institutional framework. The following part will concisely discuss these factors.

From twelve depth-interviews, a survey, observations and several open interviews it became clear that in the last 5 years firms are involved in *process, product, and functional upgrading*. No *intersectoral* forms of upgrading were measured. In process upgrading, 89% of the questioned firms claimed that they introduced new or improved wine-making techniques in the last 3 years. In product upgrading, the survey also showed similar outcomes, 72% of the questioned firms claimed to conduct a form of product upgrading in the last 5 years. Efforts in forms of adding activities like marketing and brand naming shows that functional upgrading is also present in the last 5 years in the Serra Gaúcha wine cluster.

Having answered all the sub-questions, it has become clear what the solution is to the main research question:

Which factors constrain and enable the process of upgrading the Brazilian wine cluster within global value chains?

The Brazilian wine cluster Serra Gaúcha became a specialized wine cluster because of its history. For a long time, family tradition and routines were constraining firms in the region to upgrade. A change in this has occurred about 15 years ago when some firms started to produce more quality wines. Assisted by governmental institutions like Embrapa, innovative methods were used to improve products and production. The firms had an agreement to set up Ibravin, a marketing institution supported by a part of the firms, which make sure that Brazilian wines are being sold internationally. These two organizations are an important factor in the ability of most winemaking firms to upgrading in Serra Gaúcha. Only the larger firms make use of flying winemakers, which provide knowledge and technology from abroad. Most enabling factors came from the entrepreneurial drive to upgrade, factors like; *'keeping up with the changing market'*, *'the willingness to upgrade'* and *'keeping up with the industry'* were mentioned often in the interviews and surveys as enabling factors that influence upgrading and are dependent on the effort of the firms. Other factors that enable upgrading in the Brazilian wine cluster that were mentioned are *'The presence of Embrapa'* and *'the access to technology'*. These are efforts of governments and universities that have a good effect on upgrading. But governmental actions also cause constraining factors; *'The Brazilian tax climate'* is often mentioned as one of the most important factors that makes upgrading difficult. *'The increasing competition in national markets'* and *'difficulty accessing markets'* are also partly governmental faults because of the tax scheme between Brazil and Chile that enables Chilean wines to enter the Brazilian market without paying taxes and causes a disadvantage for Brazilian winemaking firms. The Brazilian government is trying to help Brazilian wines to enter international markets, but it is still on a very small scale. *'The lack of financial recourses'* was also indicated as a constraining factor, but this is partly because of the size of some firms and the relative young age of the industry. This problem is a well known in several industries in this part of its life cycle.

5.2 Policy Recommendations

Based upon several interviews with winemaking firms, organizations like Embrapa and Ibravin, and several experts it became clear that the government has an influential position that can affect the Brazilian wine industry. Measures can be made that could strengthen the Serra Gaúcha wine cluster and competitiveness of the entire wine industry of Brazil. The recommendations below are meant as an addition to the existing governmental policy, and need further study for a complete elaboration of any changes in policy.

(I) *Investments in technology*

The presence of Embrapa seem to have a positive effect on the capabilities of firms to upgrade. In this research institute a lot of solutions are made for any problems that can occur in the wine clusters such as insects on grapes, bad soil and bad climate. With the cooperation between Embrapa and the wineries, these problems can be overcome more easily and the region could become economically stronger and have better competitive chances against wines from other countries. Investments in technology could also involve research universities that have partnerships with the region. This is already done in small amounts but more investments are desirable.

(II) Investments in promotion activities

In the last three years the Brazilian government has put efforts to put the Brazilian wine industry on both domestic as international wine market. In the national market, the government was evolved with several promotion activities organized by subsidizing promotion organizations that put efforts to change the wine drinking culture in Brazil and changing the bad reputation Brazilian wines have in their own country. Internationally governments are trying to assist in promotion by serving only Brazilian wines at the Brazilian embassies. Ibravin is the largest promotion organization for the Brazilian wine industry and is subsidized by the government. With its projects *Vinhos do Brasil* and *Wines from Brazil*, they make a big difference in domestic and international sales. It is important for the government to continue this support to the promotion projects. The Brazilian wine industry is in the starting phase of its lifecycle and trying hard to enter the global wine market. A lot of investments in promoting the Brazilian wine products are crucial for the success of this industry.

(III) Trade related constraints

One of the most frequently mentioned constraints is the tax climate of Brazil. The cumulative structure of the tax system works that for every individual activity, tax is paid. This has the effect that the price of the final product is very high. This is not just for the wine industry but it applies for all industries in Brazil. A reform of the tax system would be a positive change for several Brazilian industries in their international competitiveness. Another point of attention is the import/export schemes that the Brazilian government has with Chile. For Chile, the wine industry is an important industry for the economy. In Brazil, the wine industry is relative small and therefore less important than the manufacturing industry. An agreement is made with Chile that Brazil can import manufactured industrial goods into Chile without have to pay import tariffs and Chile can import their wine into Brazil without paying taxes. This is a big disadvantage for the Brazilian wine industry for its competitiveness on the domestic wine market and therefore it is in the best interest for the Brazilian wineries that the Brazilian government reviews this trade agreement with Chile.

5.3 Shortcomings

This research has exposed several factors that can influence upgrading in the Serra Gaúcha wine cluster. However, due to the limitation of the research period, the focus of the empirical research was only on the upstream factors of upgrading in the value chain.

Further research is recommended to explain the influence of downstream factors on upgrading of the Brazilian wine industry. Retailers and wholesalers are expected to have a large market share and influence on the upgrading process of the cluster.

Further research is also needed to investigate more on the improvements governments can make to strengthen the wine industry on the one hand and increase the entrepreneurial drive to upgrade by a lot of (small) wineries on the other hand.

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List of interviews

Dr. Marcos. Botton, Engineer Agronomy, Research Scientist – Entomology, *Embrapa*, Bento Gonçalves, period 14-04-2010 – 03-07-2010

Ms. Patricia Carraro, CEO, *Lidio Carraro*, Bento Gonçalves, 24-06-2010

Mr. Mozart Fogaça Jr., Marketing Manager, *Agromen tecnologia*, Porto Alegre, 28-05-2010

Mr. André R. Fiorese, Export & Sales Manager, *Vinícola Peterlongo*, Rio de Janeiro, 29-07-2010

Mr. Rodrigo Geisse, Export Manager, *Vinícola Geisse*, Bento Gonçalves 20-06-2010

Mr. Alexander Hoffman, Manager of Communications and Business Area, *Embrapa Uva e Vinhos*, 14-04-2010, Bento Gonçalves

Mr. Patrick Laban, Executive Director, *Wijnkoperij Wielinga*, Leeuwarden, 16-02-2010

Mr. Fabiano Maciel, Export and Import Manager, *Miolo Wine Group*, Bento Gonçalves 29-06-2010

Mr. Niels van der Meulen, Executive Director, *The Cool Company*, Nieuwegein, 04-03-2010

Mr. Andreia Milan, Export Manager, Project: *Wines from Brazil, Ibravin*, Bento Gonçalves, 14-04-2010

Mr. Vagner Monteggiore, Export Coordinator, *Vinícola Salton*, Bento Gonçalves 19-06-2010

Ms. Rosana Pasini, Export / Import Supervisor, *Cooperation Vinícola Aurora LTDA*, Bento Gonçalves 15-06-2010

Dr. Lee Pegler, Lecturer Human Resources and Employment, *International Institute of Social Studies of Erasmus University Rotterdam*, The Hague, 16-02-2010

Prof. Jorge Verschoore, Senior lecturer and researcher, *University of Unisinos*, São Leopoldo, period 12-03-2010 – 03-07-2010

Ms. Maiquel Vignatti, Marketing Manager, *Vinícola Garibaldi*, Bento Gonçalves 29-06-2010

Dr. Evert-Jan Visser, Senior Policy Advisor, *Ministry of Economic Affairs*, The Hague, 03-03-2010

Mr. Flavio Pizzato, Chief winegrower and CEO, *Pizzato Vinhas e Vinhos*, Bento Gonçalves, 24-06-2010

Mr. Antônio Dal Pizzol, CEO, *Vinícola Dal Pizzol*, Bento Gonçalves 20-06-2010

Mr. Marco Antonio Salton, CEO, *Vinícola Val Marino*, Bento Gonçalves 26-05-2010

Mr. Silverioa Salvati, CEO, *Cantina Salvati & Sirena*, Bento Gonçalves 26-05-2010

Mr. Menno van Wageningen, Director, *Wijnhandel Van Wageningen en De Lange*, Utrecht, 16-02-2010

Ms. Elisa Walker, Export Department, *Casa Valduga*, Bento Gonçalves 14-06-2010

Prof. Dr. Eduardo de Oliveira Wilk, Researcher at department of economics, *University of Unisinos*, São Leopoldo, period 29-03-2010 – 03-07-2010

Appendix 1: Interview guide

Entrevista em Português e Inglês

Interview in Portuguese and English

1 Evolução da Serra Gaúcha - Evolution of Serra Gaúcha

1.1 Você pode descrever brevemente a sua função atual e sua experiência profissional?
Can you briefly describe your current function and your professional background?

1.2 A produção de vinho da Serra Gaúcha tem uma longa história, que remonta aos imigrantes italianos no final do século 19.

Quão importante tem sido esta história para o desenvolvimento do cluster do vinho na Serra Gaúcha? E até que ponto essa história afetar o desempenho do cluster do vinho na Serra Gaúcha, hoje?

Wine production in the Serra Gaúcha Region has a long history, dating back to Italian immigrants of the late 19th century.

How important has this history been for the development of the wine cluster in Serra Gaúcha? And to what extent does this history affect the performance of the wine cluster in Serra Gaúcha today?

1.3 Não é que o isolamento por causa da tradição familiar e geográfica que a Serra Gaúcha cluster do vinho região permaneceu relativamente isolada das novas tecnologias, a evolução e as tendências do mercado internacional durante as últimas duas décadas?

Is it not that because of tradition and relative geographical isolation that the Serra Gaúcha Region wine cluster remained relatively isolated from new technology, developments and international market trends during the last two decades?

2 Competição e cooperação Competition and cooperation

A competição é geralmente considerada como benéfica para o processo de inovação. Por outro lado, às vezes é melhor para as empresas a cooperar estrategicamente no processo de inovação e formação, em investimentos conjuntos em equipamentos e tecnologia, em marketing e lobby conjunto do governo.

Competition is generally regarded as beneficial to the innovation process. On the other hand, sometimes it is better for firms to strategically cooperate in innovation process and training, in joint investment in equipment and technology, in joint marketing and lobbying of the government.

2.1 Quem são seus principais concorrentes e onde eles estão localizados (regional, nacional, internacional)?

Who are your major competitors and where are they located (regionally, nationally, internationally)?

2.2 De que maneira você cooperar com outras empresas (concorrentes, fornecedores, compradores, operadores de logística, marketing) ou institutos na região?

In what ways do you cooperate with other companies (competitors, suppliers, buyers, logistics operators, marketing) or institutes in the region?

2.3 Qual é a importância da proximidade (geográfica) de cooperação espacial?

What is the importance of spatial (geographical) proximity for cooperation?

2.4 Você cooperar com empresas ou institutos de fora da região ou até mesmo internacional?

Do you cooperate with companies or institutes outside the region or even internationally?

2.5 Qual é (a negociação) posição dos produtores de vinho locais no Brasil vis a vis os seus (internacional), compradores? Em outras palavras, como o poder é distribuído dentro da cadeia?

What is the (bargaining) position of local wine producers in Brazil in respect to their (international) buyers? In other words, how is the power distributed within the chain?

3 Melhoramento Upgrading

Podemos distinguir três tipos de atualização; Processos, Produto e Funcional. Abaixo, as três formas de atualização são ilustradas por exemplos.

We can discern three types of upgrading; Process, Product and Functional. Below, the three forms of upgrading are illustrated by examples.

3.1 A sua empresa de participar no processo de modernização em termos de melhoria de Processos? (Porfavor, explique)

Does your firm engage in process upgrading in terms of Process upgrading:

- | | |
|--|---|
| - Introduzido novas máquinas | <i>Introduced new machines</i> |
| - Re-organizou o processo de produção | <i>Re-organized the production process</i> |
| - Reduziu o tempo de entrega do produto | <i>Reduced the time of product delivery</i> |
| - Introduziu um sistema de controle de qualidade | <i>Introduced a quality control system</i> |
| - Investido na educação dos funcionários | <i>Invested in educating the staff</i> |

Explique; _____

3.2 A sua empresa de participar no processo de modernização em termos de melhoria do Produto?(Porfavor, explique)

Does your firm engage in process upgrading in terms of Product upgrading:

- Melhorou a qualidade de seus produtos
Improved the quality of your products
- Desenvolveu novas linhas de produtos em seu segmento de mercado tradicional
Developed new lines of products in your traditional market segment
- Desenvolvido novas linhas de produtos em um segmento de mercado novo e distinto
Developed new lines of products in a new and distinct market segment
- Introduziu uma nova marca a entrar em um novo segmento de mercado e distinta
Introduced a new brand to enter in a new and distinct market segment
- Entrou em um novo mercado regional
Entered in a new regional market

Explique; _____

3.3 A sua empresa de participar em processo de modernização em termos de adaptação Funcional?(Porfavor, explique)

Does your firm engage in process upgrading in terms of Functional upgrading:

- | | |
|--------------------------|----------------------|
| - Manufatura | <i>Manufacturing</i> |
| - Colheita | <i>Harvesting</i> |
| - Distribuição | <i>Distribution</i> |
| - Comercialização | <i>Marketing</i> |
| - Brand nomeação | <i>Brand naming</i> |

Explique; _____

Ibravin, Embrapa e Wines from Brazil.

Ibravin está trabalhando em um grande programa de promoção para a venda internacional de vinhos brasileiro, chamado de "Vinhos do Brasil". Ele também lida com o marketing de sua região para vendas no mercado interno.

Ibravin is working on a big promotion program for the international sales of Brazilian wines, called 'Wines from Brazil'. It also handles the marketing of your region for domestic sales.

3.4 Você já notou qualquer diferença nas vendas nacionais e internacionais? E até que ponto você acha que isso é devido ao Ibravin?

Have you noticed any difference in national and international sales? And to what extent do you think it is due to Ibravin?

3.5 O governo fez com a criação da Embrapa muito para proporcionar melhorias do setor e investe muito em pesquisa. Em que medida é que você faça uso do conhecimento / pesquisa feita na Embrapa?

The government did with the creation of Embrapa a lot to provide improvements of the industry and invests a lot in research. To what extent do you make use of the knowledge/research done at Embrapa?

3.6 Você acha que o governo está fazendo o suficiente para melhorar a indústria de vinho de adaptação ou você pode pensar em alguns pontos de melhoria?

Do you think the government is doing enough to improve the upgrading wine industry or can you think of some points of improvement?

3.7 O Brasil não é um vinho tradicional país produtor e às vezes as empresas tendem a contratar especialistas estrangeiros para ajudar a melhorar os seus conhecimentos sobre vinhos, ou ajudá-los a melhorar o processo ou produto. Um exemplo pode ser visto no sucesso da indústria do vinho chileno, alguns dizem que é devido à contratação de peritos estrangeiros. Em que medida é que tais especialistas estrangeiros consultados na sua empresa?

Brazil is not a traditional wine producing country and sometimes firms tend to hire foreign experts to help improving their knowledge about wines or helping them upgrade the process or the product. An example can be seen in the success of the Chilean wine industry, some say it is due to the hire of foreign experts. To what extent is such foreign expertise consulted in your firm?

4 Factores que permitem ou restringem a atualização

Factors that enable or constrain upgrading

4.1 Quais são os três fatores mais importantes que permitem a inovação/atualizar (= inovação para criar valor acrescentado) na sua empresa?

What are the 3 most important factors enabling upgrading/innovation (= innovation to create value added) in your company?

- | | | |
|---|---------------------------------------|--|
| - | Pesquisas realizadas na Embrapa | <i>Research at Embrapa</i> |
| - | Promoção / Marketing feito em Ibravin | <i>Promotion/Marketing done at Ibravin</i> |
| - | Disposição para Upgrade | <i>Willingness to Upgrade</i> |
| - | Stimilación por compradores | <i>Stimulation by buyers</i> |
| - | Stimilación pelos fornecedores | <i>Stimulation by suppliers</i> |
| - | Stimilación pelo governo | <i>Stimulation by government</i> |
| - | Stimilación por outras empresas | <i>Stimulation by other firms</i> |

- Mantendo-se com a indústria (nacional e internacional) *Keeping up with the industry(national & international)*
 - Mantendo-se com a evolução do mercado *Keeping up with the changing market*
 - Educar pessoal *Educating staff*
 - Consultoria doméstica peritos externos *Consulting domestic external experts*
 - foreign Consulting peritos externos *Consulting foreign external experts*
 - Alterações em lucro *Changes in profit*
 - Acesso à tecnologia *Access to technology*
 - Outros (especificar): _____
-

4.2 Quais são os três fatores mais importantes restringindo a atualização / inovação (= inovação para criar valor acrescentado) na sua empresa?

What are the 3 most important factors constraining upgrading/innovation (=innovation to create value added) in your company?

- Falta de recursos financeiros *Lack of financial resources*
- Falta de conhecimento em marketing *Lack of knowledge in marketing*
- Imposto sobre o clima do Brasil *Tax climate of Brazil*
- Dificuldade em conseguir acesso a know-how tecnológico *Difficulty in getting access to technological know-how*
- Dificuldade de acesso aos mercados *Difficulty in accessing markets*
- O aumento da concorrência nos mercados nacionais *Increasing competition in the national markets*
- O aumento da concorrência nos mercados internacionais *Increasing competition in the International markets*
- Disponibilidade limitada de novas terras *Limited availability of new land*
- Escassez de recursos humanos qualificados *Skilled manpower shortage*
- Escasso apoio institucional *Scarce institutional support*
- Mudanças nos gostos dos consumidores *Changes in consumers' tastes*
- Infra-estrutura deficiente *Poor infrastructure*
- Má colheita devido ao clima *Bad harvest due to the climate*
- Má colheita devido a mau solo *Bad harvest due to bad soil*
- Má colheita devido a insetos em uvas *Bad harvest due to insects on grapes*
- Outros (especificar): _____

Obrigado pela sua colaboração, se você quiser enviar os resultados por e-mail, por favor selecione 'sim' ou 'não'.

Thank you for you cooperation, if you want the results send by email, please select 'yes' or 'no'.

Eu quero receber o resultado por e-mail

- Sim
- Não

Appendix 2: Survey

Levantamento das empresas brasileiras de vinho

Esta pesquisa levará cerca de 15 minutos

Os resultados serão tratados com cuidado (nomes de empresa e data serão tratadas de forma discreta e não serão publicados)

Após o preenchimento o questionário, solicitamos que postem o mesmo via correio utilizando o envelope em anexo.

O upgrading da indústria vinícola brasileira

Pesquisa

O objetivo desta pesquisa é obter informações sobre os fatores que restringem/ limitam e permitem / favorecem o processo de upgrading do grupo de vinhos brasileiros, a fim de avaliar analiticamente a evolução do desempenho do grupo dentro de cadeias globais de valor e dos mercados (inter)nacionais.

O termo upgrading é muitas vezes / comumente descrito como "fazer produtos melhores, produzindo-os de modo mais eficiente ou passar a praticar atividades mais qualificadas".

Três tipos de upgrading podem ser apontados:

- Upgrading de Processo - é a reorganização do processo de produção, tornando-o mais eficiente. Um exemplo de upgrading de processo na indústria do vinho é na melhoria da tecnologia utilizada para produzir o vinho, a fim de economizar tempo e dinheiro.
- Upgrading de produto - é uma melhoria nos produtos ou serviços que são produzidos por uma empresa. A melhoria da qualidade do vinho é um exemplo de upgrading do produto.
- O upgrading funcional está adquirindo funções novas e superiores na cadeia, tais como design ou marketing, ou de abandonar funções existentes de baixo valor agregado para focar em atividades de maior valor agregado.

A questão principal da pesquisa é:

- Quais os fatores que restringem e favorecem o processo de atualização do grupo de vinhos brasileiros dentro das cadeias globais de valor?

Questões de pesquisa:

- Quais mudanças podem ser vistas como upgrading na indústria do vinho e qual a evolução que pode ser vista na indústria vinícola brasileira?
- Como os grupos evoluíram ao longo do tempo e como as empresas de vinhos brasileiros reagem dentro do grupo Serra Gaúcha?
- Onde a maior parte do valor está sendo criado e capturado em uma cadeia de valor global e quem tem a capacidade de obter a maior parte dele?
- Quais os fatores que restringem e favorecem o upgrading? E quais fatores facilitadores e inibidores podem ser observados na indústria vinícola brasileira?

O resultado sobre o upgrading do setor vinícola poderá ser importante para a economia local. Este conhecimento poderá contribuir para a melhoria na produção, podendo levar ao aumento das exportações de vinhos e, o mais importante, poderá fornecer percepções sobre como os produtores locais poderão captar valor agregado.

Marnix van Nierop
MSc Estudante Universidade de Utrecht, Países Baixos
Pesquisador em Unisinos, São Leopoldo, Brasil

Seu contato:

Nome: _____

Função na empresa? _____

1 Dados Gerais

Nome da empresa: _____

Endereço: _____

Código postal & cidade: _____

Telefone: _____

Email: _____

1.1 Desde quando é que o gerador da empresa na Serra Gaúcha área? _____ (Anos)

1.2: Esta empresa é uma:

Independente

Parte de um grupo

Fusão, _____

Outros, _____

1.3 O principal produto da empresa:

Vinhos Finos

Vinhos Tintos

Vinhos a granel

Vinhos Brancos

Suco de uva

Vinhos Rosa

Outros, _____

Espumantes

1.4 Quais é o tamanho atual da sua empresa em termos de:

Número de hectares de vinho	Ha:
Número de garrafas produzidas por ano	Garrafas:
Número de empregados permanentes	Empregados:

1.5 Qual é a percentagem de uvas próprias _____ %

2 Recursos Humanos

2.1 Por favor, indique o número de empregados permanentes na sua empresa com qualquer uma das seguintes qualificações terciário:

Qualificação	Número
Bacharel em Viticultura Enologia	
Mestrado ou Doutorado em Viticultura Enologia	
Licenciatura em Viticultura Enologia	
Outros (especificar)	

2.2 A sua empresa conta com consultores externos do Brasil? Em caso afirmativo, indicar o nome da organização (exemplo das organizações Embrapa, Ibravin, Aprovale ou, feiras de vinhos.

SIM, qual: _____ Não

2.3 A sua empresa depende de consultores estrangeiros consultores ? Em caso afirmativo, selecione o país de origem dos consultores externos.

SIM, qual : _____ Não

2.4 Em quais atividades são utilizados consultores externos ? (Mais respostas possíveis)

- Treinamento
- Marketing
- novo maquinário
- Tecnologia
- Peças do processo de produção
- Logística
- Outros, ; _____

2.6 Será que os técnicos (viticultores, enólogos, gerente da adega) da empresa participam de cursos de formação / seminários no exterior? Se sim, onde?

SIM, : _____ Não

2.5 Com que frequência esses técnicos (viticultores, enólogos, gerente da adega) da empresa participam de cursos de formação ou seminários?

Menos de um por ano cerca de 1 por ano mais de 1 por ano Nunca

3 Execução Performance

3.1 Quais foram as mudanças no desempenho nos últimos cinco anos?

	+	=	-
3.1 Saída			
3.2: % Exportados			
3.3 As vendas anuais			
3.4 O lucro líquido			
3.5 O preço médio dos produtos			
3.6 Qualidade média dos produtos			
3.7 Número de trabalhadores			

- + Aumento
- = permanece o mesmo
- Diminuição

Se aumentar ou diminuir, especificar a intensidade:

- + aumento pequeno OU ++ grande aumentar
- pequena diminuição OU -- grande diminuição

4 Atualizando Processo de modernização

4.1 Quanto (em reais) que sua empresa investiu nos últimos cinco anos em novas máquinas ou equipamentos?

R\$: _____

4.2 Será que sua empresa ampliou as vinhas existentes, ou comprou novas terras nos últimos cinco anos?

Ha _____

4.3 Em quantos hectares a sua empresa investiu em melhorias para a vinha existente nos últimos 5 anos? (Por exemplo, re-implante, reposição de linha):

Ha _____

4.4 Será que sua empresa introduziu novas ou realizou melhoria nas técnicas de vinificação nos últimos 3 anos? (Por exemplo, fermentação, clarificação, micro-oxigenação, etc)

- SIM Nao

4.5 Nos últimos cinco anos, a sua empresa empreendeu qualquer tipo de experimentação, individualmente ou em conjunto com outras organizações (centro de pesquisa, agências de extensão, universidades, etc)?

- SIM, (Por exemplo, ensaios, o barril, seleção de clones, etc ...)
 Não, → Vá à questão 4.9

4.6 Foram algumas das atividades experimentais acima descritas realizadas em colaboração com terceiros (instituições de pesquisa, associações de produtores, organizações industriais, etc)?

- SIM Não

4.7 Se assim, com quem?

Modernização do produto

4.8 Você já tentou melhorar o seu produto, nos últimos cinco anos? Por favor, selecione um dos mais importantes.

- Melhoria da qualidade de seus produtos
 novo Desenvolvido linhas de produtos em seu segmento de mercado tradicional
 novo Desenvolvido linhas de produtos em um segmento de mercado novo e distinto
 introduzida uma nova marca a entrar em um novo segmento de mercado e distinta
 Outro, : _____

	<u>Fabrico</u>	<u>Colheita</u>	<u>Distribuição</u>	<u>Marketing</u>	<u>Esforços de consolidação de marca</u>	<u>Outros (especifique)</u>
4.9 Quais atividades sua empresa realiza?						
4.10 Há 5 anos,quais atividades sua empresa realizava?						

5 Conhecimento

5.1 Quanto ao desenvolvimento de novos produtos ou de processos produtivos melhorados, quais são as maiores fontes de informação para sua companhia, especialmente para o acesso a novos conhecimentos ou know-how? Por favor especifique também a região geográfica da fonte (marque o país de sua fonte mais importante apenas).

Por favor especifique a importancia da contribuição usando uma escala de 1 a 5 em que:

1. Nenhum relacionamento: absolutamente irrelevante como uma fonte de informação.
2. Fraco: é uma fonte de informação, porém, as informações trazidas raramente tratam de inovação.
3. Parcialmente forte: A informação é apenas parcialmente contribuinte para a inovação
4. Médio: Quando a informação traz soluções para o desenvolvimento de inovação.
5. Forte: Fonte de informação, como informação mais relevante no que tange a inovação.

<u>Fontes de informação</u>	<u>Nota</u>	<u>Nacional</u>	<u>América do Sul</u>	<u>Europa</u>	<u>EUA</u>	<u>Outros</u>
<u>Fornecedores</u>						
<u>Clientes</u>						
<u>Vinícolas</u>						
<u>Laboratórios de Teste</u>						
<u>Organizações do setor</u>						
<u>Universidades</u>						
<u>Consultores Privados</u>						
<u>Feiras de Vinhos</u>						
<u>Outros (especifique)</u>						

6 Determinantes Global de Atualização

6.1 Destino do produto

	<u>Brasil</u>	<u>América do Sul</u>	<u>EUA</u>	<u>Europa</u>	<u>Outros (especificar)</u>
a) % de suas vendas totais					
b)					
c) % de seu total de vendas há 5 anos					
d)					

6.2 Compradores

a) Com quantos compradores você negocia atualmente?
b) Há 5 anos, com quantos compradores você negociava?

7 Fatores que permitem ou restringem a atualização

7,1_Quais são os três fatores mais importantes que permitem a atualização/ inovação (= inovação para criar valor acrescentado) na sua empresa?

- Pesquisas realizadas na Embrapa
- Promoção / Marketing feito em Ibravin
- Disposição para Upgrade
- Estimulado por compradores
- Estimulado pelos fornecedores
- Estimulado pelo governo
- Estimulado por outras empresas
- Mantendo-se com a indústria (nacional e internacional)
- Mantendo-se com a evolução do mercado
- Capacitação do quadro funcional
- Consultoria doméstica
- Consultoria por peritos externos
- Alterações em lucro
- Acesso à tecnologia
- Outros (especificar): _____

7,2 Quais são os três fatores mais importantes restringindo a atualização / inovação (= inovação para criar valor acrescentado) na sua empresa?

- Falta de recursos financeiros
- Falta de conhecimento em marketing
- Imposto sobre o clima do Brasil
- Dificuldade em conseguir acesso a know-how tecnológico
- Dificuldade de acesso aos mercados
- O aumento da concorrência nos mercados nacionais
- O aumento da concorrência nos mercados internacionais
- Disponibilidade limitada de novas terras
- Escassez de recursos humanos qualificados
- Escassez de apoio institucional
- Mudanças nos gostos dos consumidores
- Infra-estrutura deficiente
- Má colheita devido ao clima
- Má colheita devido a mau solo
- Má colheita devido a insetos em uvas
- Outros(especificar): _____

7.3 O que você fez para resolver estes problemas? (Mais respostas possíveis)

- Um foco em um nicho (Por exemplo: os vinhos espumantes)
- Parou o processo de modernização e contar sobre as formas tradicionais de produção
- Consultadas as instituições locais, como Embrapa, ou Ibravin
- Consulte Universidades
- Imitar outras empresas
- Contratação de peritos externos (especificar de qual país)
- Partes Terceirizados da produção de
- Obter conhecimentos em feiras de vinho
- Outros, : _____

Appendix 3: Location Quotient and Municipalities of Serra Gaúcha

The location quotient is a technique that measures the specialization or concentration of a region within a particular industry in comparison with the national average. It compares the characteristics of a local area to the national characteristics. This can be measured based on the number of firms, or the employment rate in a region. Whereby a higher location quotient means a higher concentration. So a location quotient of 63.81 means that the concentration of is 63.81 times larger than the national average. In this study, the number of wineries was measured and compared to the national average. The data was obtained from the Brazilian Institute of Geography and Statistics (IBGE, 2010). The Location quotient is measured as follows:

$$(\# \text{Firms sector X region Y} / \text{Total \# firms in region Y}) / (\# \text{Firms sector X national} / \text{Total \#national firms})$$

The Location quotient for the Serra Gaúcha wine cluster would be:

$$(\# \text{Wineries Serra Gaúcha} / \text{Total \# firms Serra Gaúcha}) / (\# \text{Wineries Brazil} / \text{Total \# firms Brazil})$$

Municipalities & Number of firms in Serra Gaúcha:

Antônio Prado:	725	Wineries in Serra Gaúcha:	704
Bento Gonçalves:	7018	Wineries in Brazil:	1200
Boa Vista do Sul:	87	Firms in Serra Gaúcha:	52 672
Canela:	1910	Firms in Brazil:	5 787 566
Carlos Barbosa:	1303		
Casca:	538		
Caxias do Sul:	21955		
Cotiporã:	204		
Fagundes Varela:	119		
Farroupilha:	3424		
Flores da Cunha:	1641		
Garibaldi:	1978		
Gramado:	2666		
Guaporé:	1710		
Monte Belo do Sul:	120		
Nova Araçá:	215		
Nova Bassano:	417		
Nova Pádua:	131		
Nova Petrópolis:	1191		
Nova Prata:	1418		
Nova Roma do Sul:	177		
Pinto Bandeira:	154		
Protásio Alves:	88		
Santa Tereza:	83		
Santo Antônio do Palma:	68		
São Marcos:	929		
Serafina Corrêa:	714		
Veranópolis:	1440		
Vila Flores:	183		
Vista Alegre do Prata:	66		
Total:	52 672		