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A competitive analysis of agriculture in Chile

Catching-up, learning capabilities and innovation of the wine industry

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Economic Commission for Latin America and the Caribbean of the United Nations

ECLAC, the Economic Commission for Latin America and the Caribbean (or CEPAL with its Spanish acronym), is one of 5 regional commissions of the United Nations, each of which is concerned with assisting and promoting economic and social development in a major region of the world. Created in 1948, ECLAC currently serves 33 Governments from the Latin America and the Caribbean region, together with several nations of North America and Europe which maintain historical, cultural and economic ties with the region. The Commission therefore has a total of 41 member States; in addition, 7 non-independent Caribbean territories hold the status of associate members. ECLAC serves as a centre of excellence in the region. It collaborates with its member States and with a variety of local, national and international institutions in undertaking a comprehensive analysis of development processes based on an examination of the design, follow-up and evaluation of public policies. Many of the ECLAC divisions that carry out these analysis and research tasks also provide technical assistance, training and information services in selected cases.

The writing of this work was carried on during my internship at ECLAC, in the agriculture unit of the Division of Production, Productivity and Management.

Contents

Introduction

Chile has been one of the first Latin American countries that have adopted structural reforms, through a radical economic shock. This shock refers to a development strategy that was more open to external competition and more deregulated, with less participation of the State as a producer of goods and service. In general, this implies a deep modification in the management of the nation's property regimes, based on a dominant market strategy, as has happened in many developing economies during the last decades of the 20th century.

During the 1980s and the 1990s, its extraordinary performance has been based on an export-led growth pattern focused on natural resources, particularly copper mining and agriculture, showing an high level of competitiveness in the international markets. Among others, agricultural products like salmon, fresh fruits and wine were drivers of this pattern.

Nowadays, Chile is one of the "New World" countries that has succeeded in increasing its market share in the global wine market through a process of product and process upgrading. Between 2000 and 2014, its share of global wine production almost doubled from 2.3% to 4.5%, meanwhile the country climbed from 11th place to become the 6th largest country producer in the world. During the same period the country ascended from being the 5th largest wine exporter in the world to the 4th, behind France, Italy and Spain. Within the same 14-year period the country managed to diversify its exports by increasing sales to China and other Asian Countries, while in contrast the European wine producers accounted for a lower share of this market. Chile also succeeded in partially advancing the global wine market, not only in terms of reserve wines, but in terms of cabernet-based premium and ultra-premium wines.

To better analyze the factors that actively contributed to the international success of the Chilean wines is important to understand the interaction between three different levels of analysis: the evolution of macroeconomic setting and the structural reforms, the sectoral competitiveness dynamics at a meso-level, and the micro-level of the wine industry.

Thus, it is necessary to relate the gross performance of the country and the impact of trade agreements, with the strategic framework for global markets

and the specific factors that support the technology within the business model of the wine industry.

These three levels are analyzed in the following three chapters.

Chapter one will analyze the evolution of the Gross Domestic Product (GDP) per capita in the last fifty years. In this context, the GDP will be dissected at the sectoral level describing the growth-path of each sector: agriculture, mining, manufacturing, utilities (electricity, water and gas supply), construction, wholesale and retail trade, transports, financial intermediation and public administration.

Moreover, the weight of each sector will be evaluated considering the labor productivity and the employment generation, giving a structural evolution of the Chilean economy. Thus, it will be possible to evaluate the role of agriculture in the whole economy and understand how the overall growth pattern has impacted this particular sector.

In the rest of the chapter, the attention will focus on the impact that stipulation of bilateral trade agreements have on the trade balance of Chile. Thus, it will be possible to explain how these agreements affect the agriculture export dynamics.

Chapter two will present a comparative analysis of the Chilean agricultural sector in relation with its regional and non-regional competitors. In this respect, the international competitiveness of Chilean wines will be also analyzed, taking into account the New World wine producing countries as market benchmarks.

In doing so, it is will be possible to evaluate the evolution of the agricultural sector and the wine industry according with the changes in their competitiveness and their position in the international market. The analysis will consider the use of two indicators -the market share and the specialization index- within the use of specific software (TradeCAN). TradeCAN is based on the competitiveness matrix developed by Mandeng (1990) and Fajnzylber (1990) that will help to define and describe the agricultural sector as a whole, with a specific focus on the wine industry in an international competitiveness context.

Chapter three will describe the evolution over time of the Chilean wine industry and the main factors that explain, at the micro-level, the increased

competiveness in the global markets in relation to New and Old World wine producing countries.

In the first part, it will presented the evolution of production, the varietal diversification, the dynamic of prices and the main target markets of the Chilean wine industry, presenting the business framework of the segment in relation to its historical path of technological evolution and foreign investments.

In the second part, it will be described and analyzed the main endogenous factors that explain the successful catching up of the industry. Thus, this part will analyze the agronomic factors (climate diversification, soils and phytosanitary conditions of the main wine producing regions), innovation in winemaking process (technological pioneers and innovation processes) and how university programs and the institutional bodies (technological consortia, public bodies and producers associations) promote technological innovation within the Chilean wine industry.

Finally, in the last part of this chapter, it will be analyze the future challenges of the industry, with special attention to environmental impact and penetration of emergent markets of the Chilean wine industry.

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Chapter I: An Overview of the Chilean Economy and the Agricultural Sector

1.1 Recent economic trends

Chile has an important and interesting economic history related to its deep and radical transformation during the second half of the 20th century. After the Great Depression in the 1930, the Chilean economy was defined by fast economic recovery and a considerable industrial growth, until the early '50s, where the economic model implemented at the time started to face new problems.

The two decades before the military coup (1973) were characterized by heterogeneous economic policies that resulted in heavy imbalances within macroeconomics. From 1952 to 1955, Chilean productivity collapsed due to excessive import substitutions and the volatility of prices of traditional exports. This shock was transmitted on the domestic economy through recurrent balance of payments shocks. This contributed to inflation rate crisis that had big repercussions on future economic policies (Ffrench-Davis, 2014).

Under the influence of the radicalization of the world's political agenda during the 1960s, President Jorge Alessandri and President Frei Montalva implemented ambitious and progressive reforms that needed solid and balanced economy to succeed, but the economic situation of Chile was far away from the optimal; high inflation rates and a weak export structure led to dangerous macroeconomic imbalances that threatened Chilean economy in the following years.

The Chilean agricultural sector at that time of the agrarian reform in 1962 was mainly characterized by large estates (latifund) and rigid hierarchical structure, in which the farmers lived under medieval-like rules and were exploited by landowners (memoriachilena.cl [1]). Therefore, President Jorge Alessandri implemented a number of reforms meant to expropriate portions of land from landowners and redistribute to small farmers. The limit was set to up to 80

[1] Access on May 18th, 2015

irrigated hectares per farmer (“80 hectares basicas”). The aim of the reform was to increase the land productivity and equality in rural areas; this started a diversification in agricultural production, a key step for future export strategies (Sotomayor, 2007).

When socialist Salvador Allende became president in 1970, he inherited an idle economic capacity with substantial international reserves. This allowed the government to implement expansionist policies with the result of a quick increase in wages and public spending. This resulted in an 8% increase of GDP in 1971 (Ffrench-Davis, 2014).

The consequence was a rapid expansion of the aggregated demand which was incompatible with a modest creation of the new productive capacity of the country. Therefore, macroeconomic imbalance sharpened rapidly. Hyperinflation was an uncomfortable constant during the presidency of Allende, where the increase in consumer prices reached the 700% in 1972.

Income distribution improved during Allende's presidency, but a tired economy with vicious cycle of hyperinflation led to sectoral deterioration, black market and distortion of prices (Ffrench-Davis, 2014).
These two decades were also characterized by important structural changes in the rural sectors, especially mining and agriculture, which improved regional integration and land productivity.

The brutal shift from socialism to a pure neoliberal economy happened through the dictatorship of Augusto Pinochet (1973-1990) where, in 1973, he overthrew the democratic government of Salvador Allende through the force.

Focusing on the analysis of the economic policies implemented during the military government, Ffrench-Davis (2014) outlines two main periods: the first (1973-1981) characterized by implementation of pure neoliberal policies into the Chilean economy and the second (1982-1990), defined bymore pragmatic but still aligned with the neoliberal theory.

Looking at the total GDP per capita of Chile (Figure 1) it is clear the impact of the shift on the country’s economy; privatization of public sector (mainly banks, healthcare, education and the agro-industry sector), lowering of trade barriers (from 94% to 10%) and deregulation of imports had filled the public treasury (Ffrench-Davis R., Rosales O., 1998). High inflation rates (more than 300% in 1974-1975), the petroleum crisis during the period of 1973-75, and a lower than predicated intensity of FDI (Foreign Direct Investments) resulted in a recession of the economy for the first period of Pinochet’s regime (in 1975 the GPD lowered by 12.9%).

After a rigorous anti-inflation monetary policy was implemented at the end of 1975, Chile showed the first sign of growth in the new economic paradigm with a low rate of inflation. Unfortunately, the “Chicago boys”, a group of Chilean economists, trained at the Department of Economics of the University of Chicago that adopted positions in the military government as economic advisors, underestimated the impact of drastic finance liberalization implemented through their economic policy. Furthermore, the decision of fixing the peso's exchange rate in 1979 and a high unemployment rate (almost 30%) dragged Chile into the worst economic crisis since 1930 (in the period 1982-1982 the GDP lowered by 13.6%).

In agricultural sector the crisis hit even harder: the entrance of speculative capital in the pre-crisis period led to the bankruptcy of several processing companies. All sectors of Chilean agriculture except fruit and forestry exports, declined during the crisis but recovery was fast after 1984. Farm bankruptcies in Chile were high in the 1979-1983 period, peaking in 1983 (Rytkönen, P. 2004).
The debt crisis was particularly strong in Chile, but the entire region was affected: it’s the so-called “lost decade of Latin America” (1980-1990).

After several adjustments of the economic policy to include a more pragmatic adoption of neo-liberal instruments, Chile showed a strong and precocious economic growth beginning in 1986, due to high dynamism of the exports, and spectacular devaluation of the Chilean peso (almost 130% between 1982 and 1988), and positive external conjuncture (increase in the price of copper).

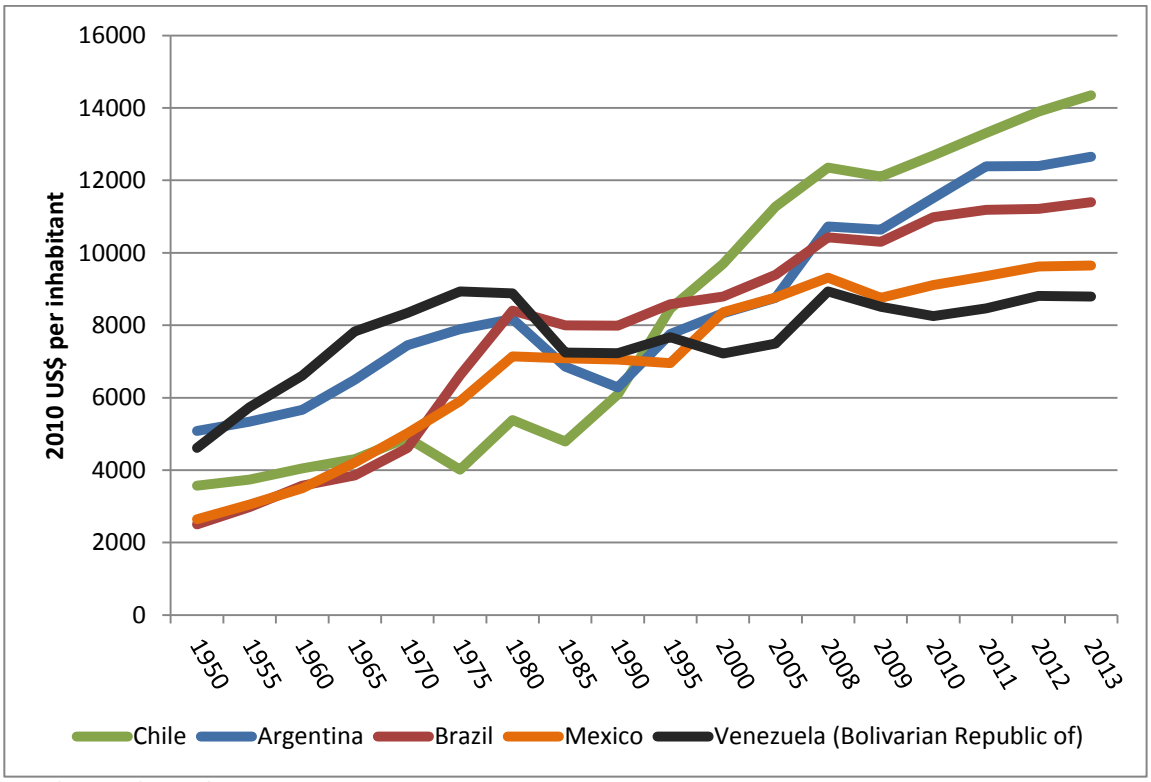
According to Ffrench-Davis (2014), during Pinochet’s regime the Chilean economy showed high GDP growth rates with high utilization of its productive capacity, preparing Chile for future economic expansion and, at the same time, outlining the vulnerability of “hardcore” neoliberal policies implemented in the country (as it happened in 1975 and 1982). At the end of the ‘80s, Chile presented itself as the “rising star” of Latin America, ready to start a new and prolific path of economic development.

After Pinochet’s abdication in 1990, Chile returned to a democratic government in 1990. Now the focus of the policymakers was “growth with equality”, without the drastic changes of the previous economic policies.

From this point on, Chile became an export-oriented country due to accurate trade policies; progressive reduction in trade barriers fostered access to information and stipulation of trade agreements with other countries. This “internationalization of the Chilean economy” also involved a process of export’s diversification: from raw materials, such as minerals (copper) or forestry products, to highly processed natural-based products (such as paper, jams or wine).

During the 1990s, Chile experienced a surprising economic boom (Figure 1) that permitted the country to move up the economic ladder. Chile was the country with the highest total GDP per capita in Latin America from 1995. The positive trend continued until the Asian Crisis of 1998, where the entire region suffered an export crisis due to negative external conjunction. However, Chile responded well and continued to increase its economic growth without signs of wavering for the first part of the new century.

Figure 1; **Total GDP per capita**



Source: CEPALSTAT

From 2003 until the economic crisis of 2008, the price of many physical commodities started to rise, leading positive effects on various Latin American countries. In Chile's case, the "commodities super-cycle" had a positive impact on the economy, due to the appreciation of copper's price (OECD, 2008).

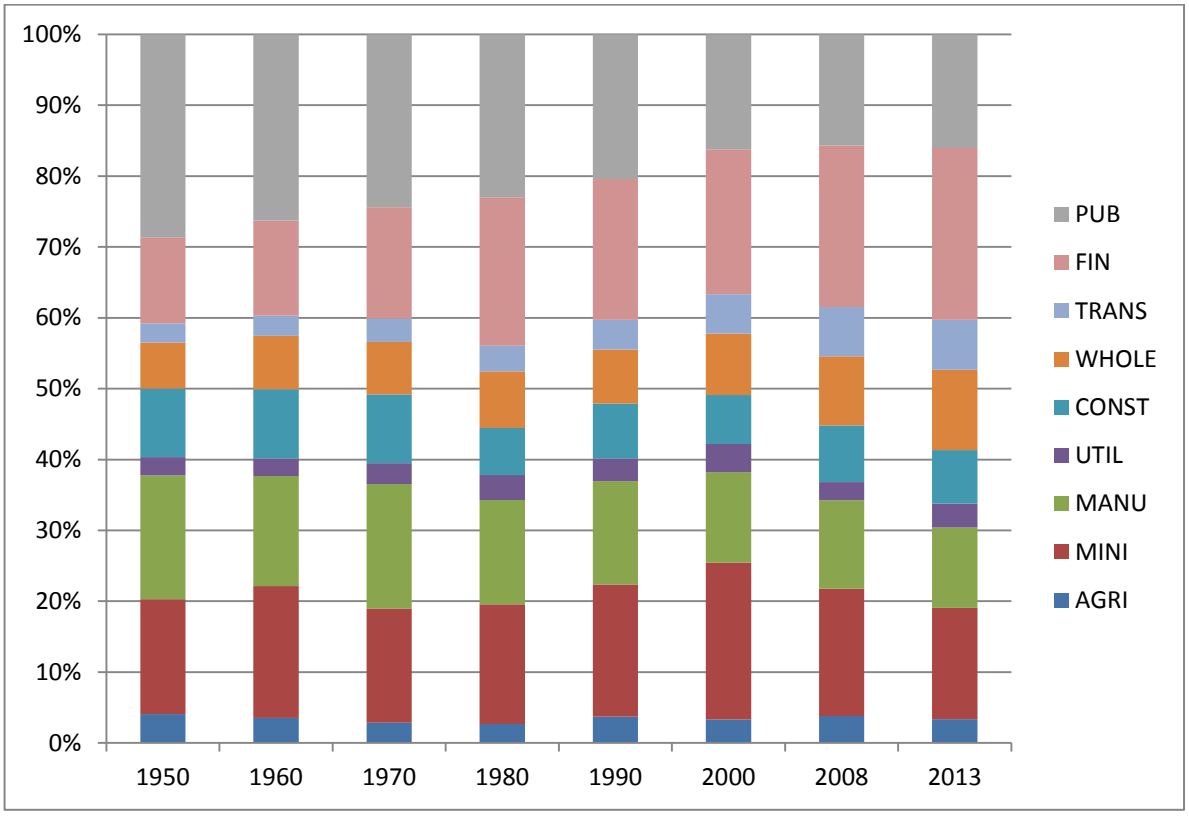
Unfortunately, 2008 was defined by the world economic crisis that affected the western economies, and as a result, exported-oriented countries like Chile registered a decrease in demand of its export goods (OECD, 2008) which led to negative economic growth in 2008-09. However, the macroeconomic framework that was built in Chile between the mid 1980s and the late 1990s is increasingly effective at managing external shocks and providing macroeconomic stability

(Banco Central de Chile, 2008). Chile learned a lesson from its past, and has thus built a resilient financial system.

Thanks to policies implemented by the government to face the global recession, in 2010 the economy started to grow again, but with a slower growth rate compared to the decade before. The economy's performance of the last four years (2010-2014) showed a sound economy, but an alarming stall could compromise future developments (Ffrench-davis, 2014).

Looking at the historical GDP composition by sector represented in Figure 2, one may analyze how some sectors increase, decrease or conserve their share in the GDP over the years.

Figure 2; **GDP of Chile by sector**



Source: CEPALSTAT

One of the most noticeable improvements is seen in the financial sector, which doubled its share in over fifty years (from a 12.2% in 1950 to a 24.3% in 2013). On the other hand, the public sector lost its importance in the GDP composition, mainly due to new economic paradigms implemented after 1973.

Other sectors showed a stable share in the GDP composition over the years; except mining that had a peak in 2000 thank to the super cycle of commodities (ODEPA, 2013). Agriculture is an excellent example of a stable and resilient sector in the Chilean economy.

During the time considered in this analysis, the contribution of the agricultural sector was stable over the years: around 4% of the total GDP. This was due to the intrinsic characteristics of the sector: agriculture is well known for its resilience in economies that are facing industrial development. Furthermore, according to Mamalakis (1967) the investments from the Chilean government into the sector were considerably low compared to other sectors: mining took the majority of resources over the last 50 years.

Technological innovation and agricultural modernization began after the Agrarian reform of 1964 (focused on land redistribution) and innovation policies took place only at the end of the '80s. In the meantime, other sectors placed innovation as a priority and started the process for structural change earlier, leaving agriculture an apparently small but stable role in the composition of the total GDP.

It is important to recognize that agriculture's long-term share of GDP does not rise to match the sector's share of employment – in all developed countries the tendency has been precisely the opposite. (OECD, 2008)

1.2 The agricultural sector and its evolution

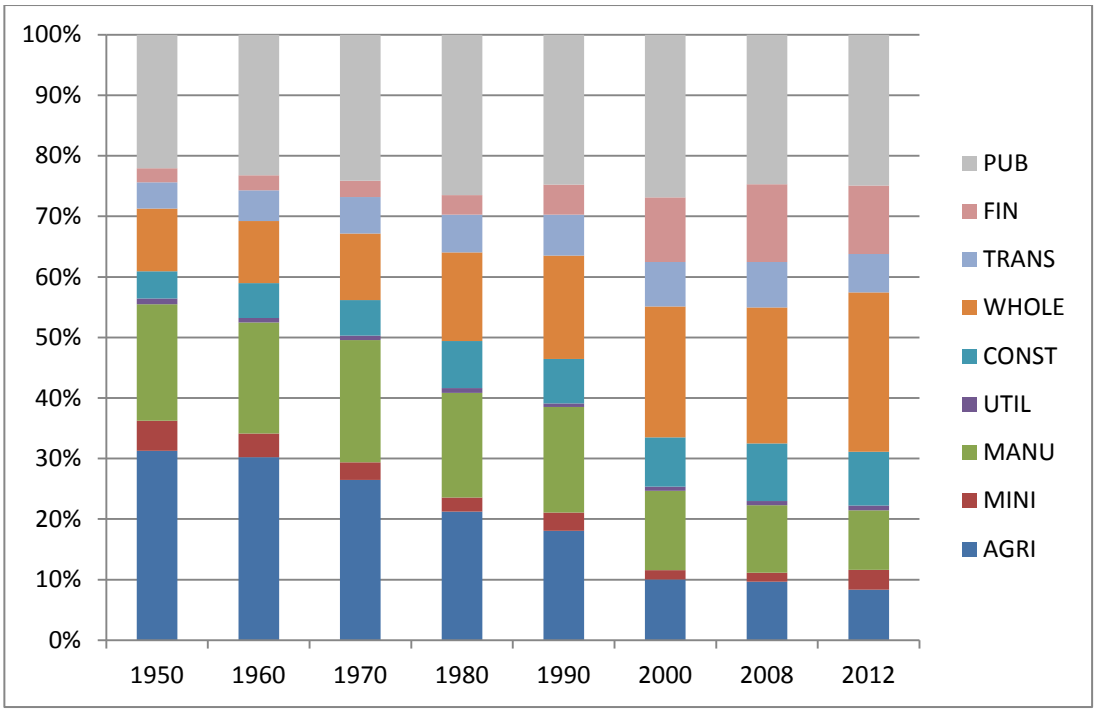
Even though during the last 50 years agriculture made a trivial contribution to government revenues, and contributed no more than 4% of the domestic product, it still remained the single most important source of employment in the economy during the period from 1950 to 1970, employing around 30% of the labor force. The relative importance of agriculture in the total economy is seen through generation of employment within this period.

The number of people, however, working in agriculture has declined as proportion of overall employment, with the fraction of the working population employed in agricultural activities declining from 19% to less than 10% between 1990 and 2000 (Figure 3). Note that in recent years the agricultural sector faces natural progression of competition in the use of labor by other branches of the economy; the reducing of employment from the agricultural sector was absorbed mainly by the financial and the wholesale sectors that offered more possibilities of earning.

The annual average of the total workforce employed in agriculture, was estimated at 795 000 workers, with a slight tendency to decline after 1985 (INE,

2007). In 2012, the Minister of Agriculture Luis Mayol, affirmed a lack of workforce estimated around of 40 000 employees in the agricultural sector of Chile[2] (El Dinamo, 2012).

Figure 3; **Employment of Chile by sector**

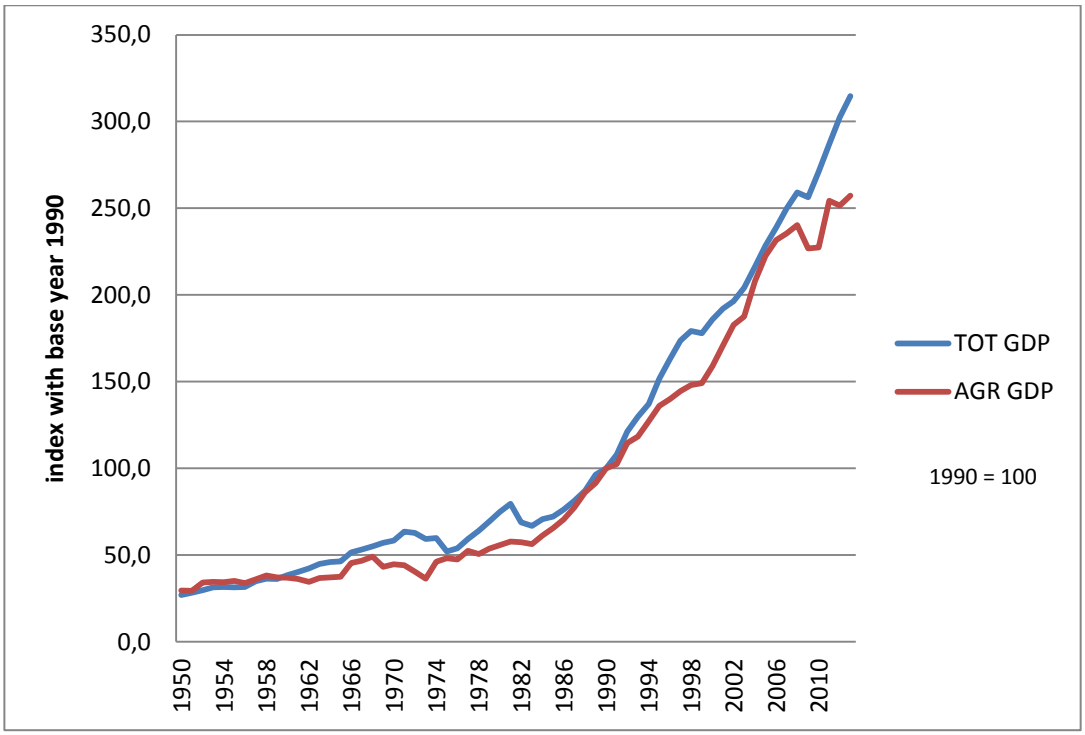


Source: CEPALSTAT

For much of the past 20 years, agricultural growth has matched growth in the rest of the economy (Figure 4), enabling the sector's share of national income to remain roughly constant, and defying the standard that agriculture's importance to the economy declines with economic development.

[2] During my visit at Viña Veramonte in May 2015 (Casablanca Valley) the owner affirmed that they are forced to use mechanical harvesters due to a lack of (well paid, he said).seasonal workers.

Figure 4; **Total DGP vs Agricultural GDP**



Source: CEPALSTAT

The agricultural sector is strategically more important than its 4% share of GDP would suggest. Chile's agricultural and agro-industrial sector has been extremely successful in adding value to the production of primary commodities and processed products, such as wine and fruits, account for a similar share of GDP to agriculture itself.

Among the sectors that produce goods, there has been a continuous growth in the labor productivity of agriculture, significantly higher than in other sectors and 4.2 times greater than the rate seen in the economy as a whole (see Table 1; ODEPA, 2013).

During the period from 2003-2012, there was a 5% annual growth rate in labor productivity in agriculture, while the overall rate across the economy was 1.2%. This growth can be explained by a sustained growth in the GDP for agriculture against the context of a relatively fixed workforce (ODEPA, 2013).

Table 1; **Evolution of productivity by sector**

Sector	1950	1960	1970	1980	1990	2000	2008	2012
Agriculture	13	11.7	10.9	12.7	20.5	33.1	39.5	41.3
Mining	325.4	476.4	551.4	727.4	629.6	1472.8	1177.4	466.6
Manufacturing	90.8	84.9	87.2	85.1	83.3	97.3	111.8	119.7
Electricity, gas and water supply	266.4	319.7	375	433	559.4	592.9	390.4	409.7
Construction	214.2	169.5	166.2	85.7	105.2	85.1	83.6	85.6
Wholesale and retail trade	62.9	73.7	67.5	54.4	44.6	40.2	43.6	42.1
Transport and communications	63.5	55.4	54.7	58.3	62.4	75	92.9	111
Financial intermediation	523	536.5	588	653.9	402.1	191.5	177	215
Public administration	129.7	113.3	101.1	86.8	82.4	60.4	63.6	64.6

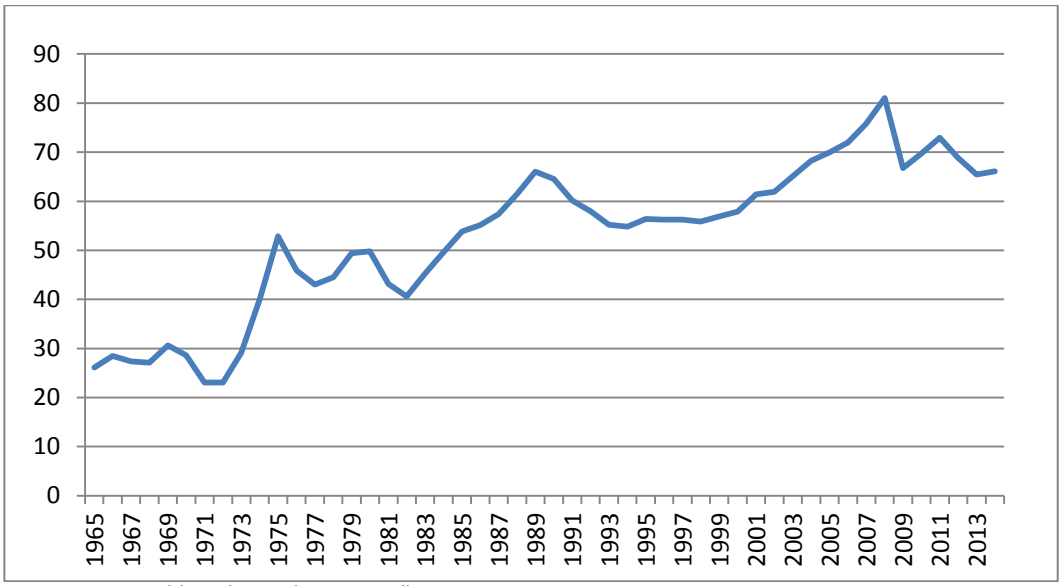
Source: CEPALSTAT

However, the sector contains a duality that heavily affects the productivity; a competitive export-oriented sector co-exists alongside an underdeveloped sector of semi-subsistence farmers (OECD, 2008).

1.3 Bilateral trade agreements and their impacts on the agricultural sector

Figure 6 showed the total trade balance of Chile (blue columns) and the trade balance of the agricultural sector (red line) over the last 30 years.
It is important to notice that after the radical change in 1973 that transformed the country into a full export-oriented economy, the degree of openness of the Chilean economy increased considerably (Figure 5).

Figure 5; **Trade openness index of Chile**



Source: World Bank Development Indicators

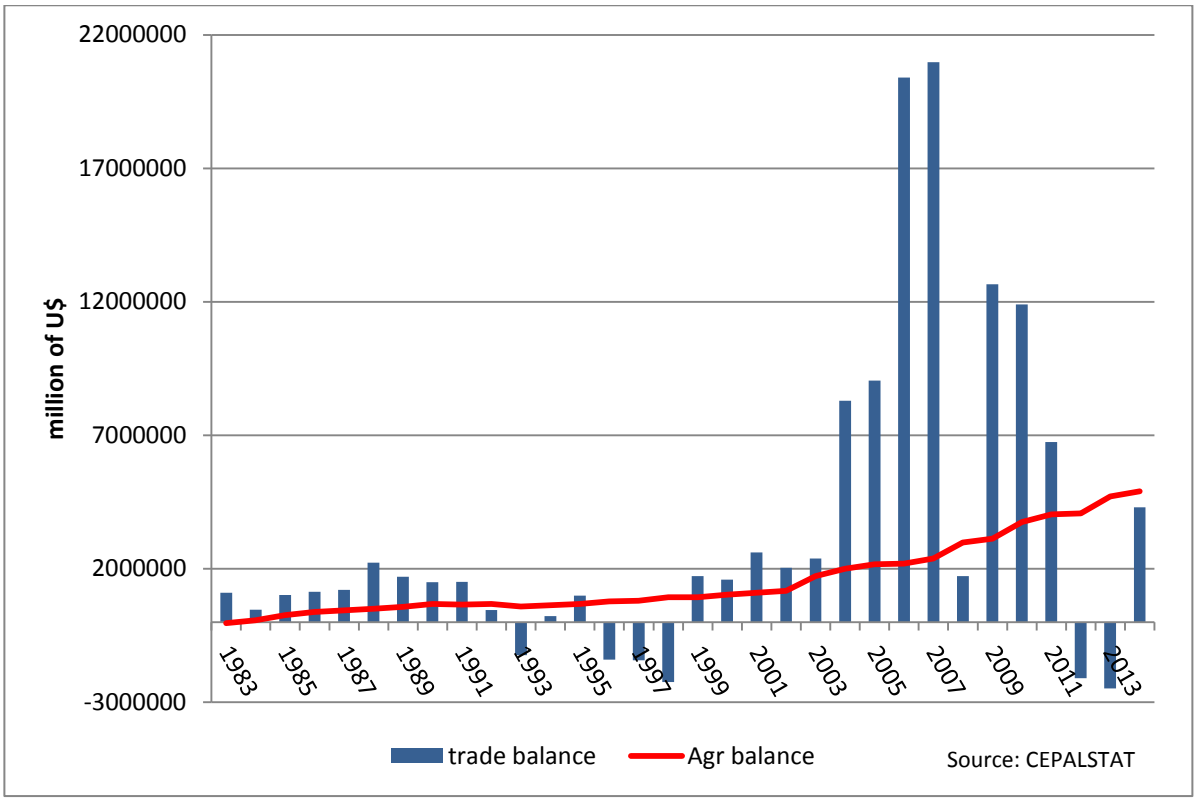
Chile has a small internal market which does not allow for sufficient economic growth (Ministry of Foreign Affairs, 2008), therefore it is forced to search for new and bigger markets around the globe to sell its goods and sustain its development process.

Analyzing the historical trade balance, except for negative external conjuncture periods, the exportations of Chile have a grown consistency during the past. The trade balance especially after 2003, registered a significant surplus due to important trade agreements stipulated with USA, EU and South Korea. This allowed Chile became one of the most important players, in terms of exports (Figure 7) (Ministry of Foreign Affairs, 2008).

Agriculture made a key contribution to Chile's overall trade balance (Figure 6), with agro-food exports accounting for about a quarter of all exports (US$ 8329.8 million; ODEPA, 2013). Even during extremely difficult years, the agricultural trade balance was always positive, showing a positive trend and an increased growth rate when the total economy balance was negative.

This is an indicator that shows how much important this sector is for an export-oriented economy like Chile.

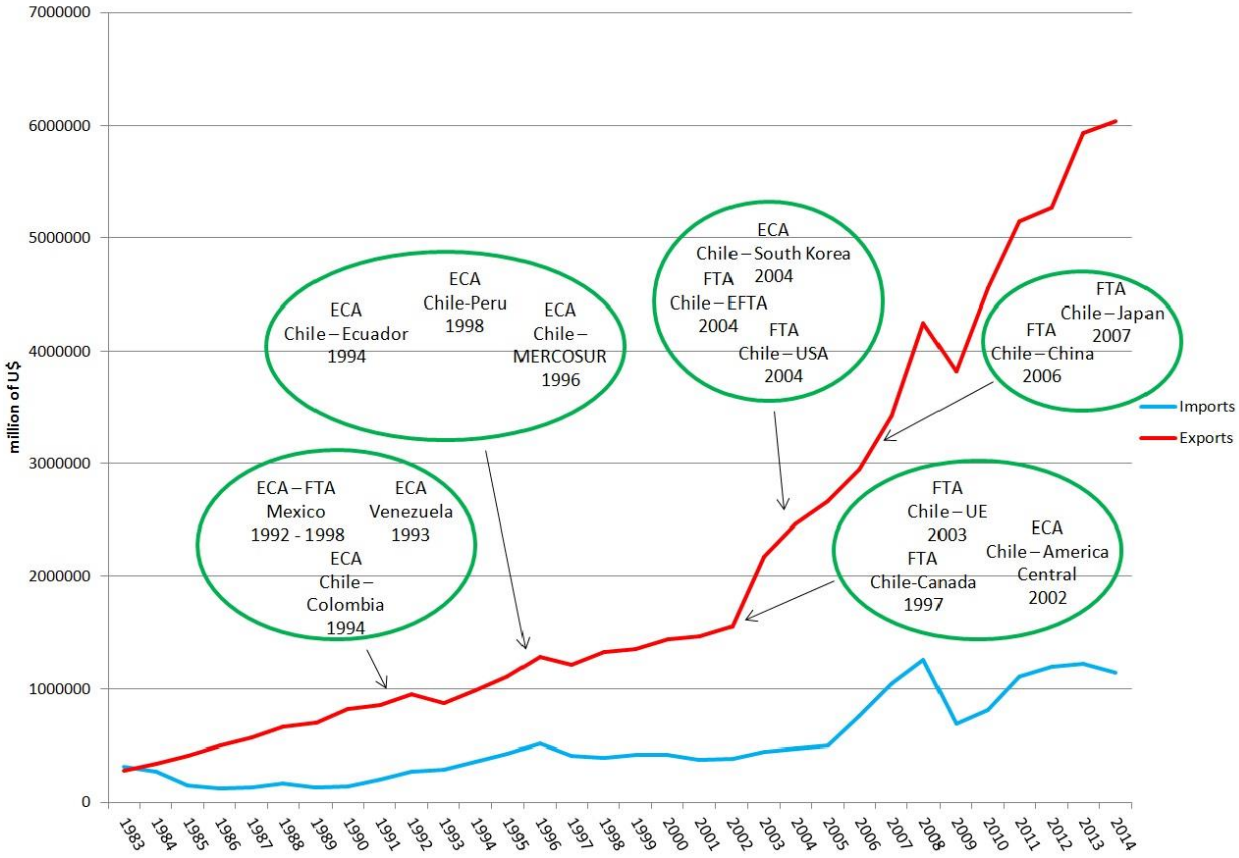
Figure 6; **Total trade balance and agricultural trace balance**



Source: CEPALSTAT

One of the key of successes of the Chilean export economy is the capability to facilitate the "globalization" of the country, through stipulation of Foreign Trade Agreements (FTA) with the main economic countries. Figure 7 highlights that Chile started this process after the establishment of democracy in 1990.

Figure 7; **Evolution of agricultural trade of Chile in combination with bilateral agreements**



Source: World Trade Organization

At the beginning of the 1990s, it was easier to stipulate trade agreements with the other Latin American countries such as Colombia, Mexico and Venezuela. Later Chile began to stipulate FTAs with its neighbors (Peru, Ecuador and MERCOSUR), mainly due to the end of the aggressive international policies implemented during the Pinochet's regime (Ffrench-Davis, 2014).

After this first cycle of "South-South" FTAs, a second cycle followed, this time with the "North". Around the end of the '90s, Chile started to stipulate FTAs with the major players of global economy such as USA, EU, Canada and South Korea. As a result, the exports of the agricultural sector had an incredible boom for the first time in the Chilean history (Figure 7).

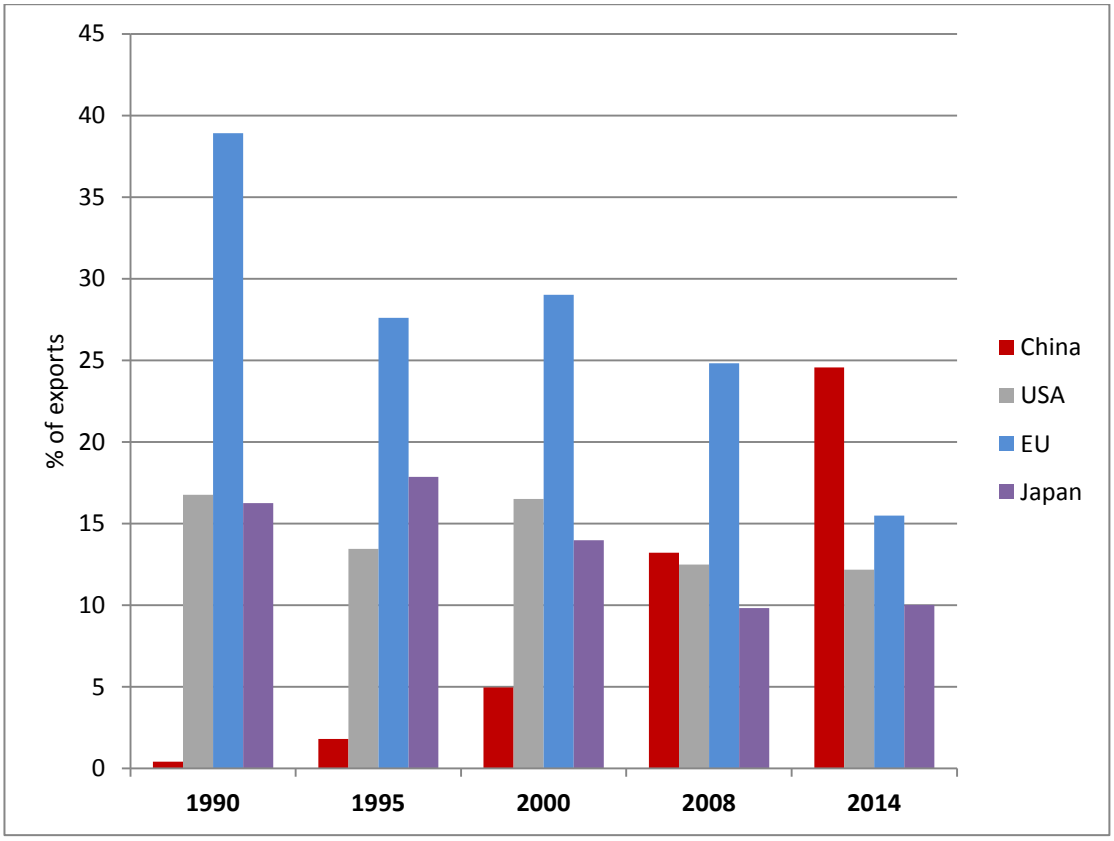
This was a big improvement for Chilean exports, but not the last one; Chile understood the potential of the Asian markets and wanted to capitalize on this opportunity. Therefore, in 2006 and 2007 Chile stipulated FTAs with China and

Japan that opened new export potential for the agricultural and mining sectors, which was strategic for present and future economic development of the country (Ministry of Foreign Affairs, 2008). In doing so, Chile is currently the country with the largest network of trade agreements in the world (L. Wehner, 2009).

Destination markets, remains crucial for two reasons; first, looking at the relative importance of the markets destination of the Chilean goods presented in Figure 8 and Figure 9, it is clear that China gained importance for the Chilean export sector in the past decade. Therefore, the importance of a FTA with this country is crucial to ensure access to this key market.

Second, in front of a stable percentage of export in USA and Japan, it is important to notice the loss of the EU after 2008, where the economic crisis struck hard and the economy is struggling to get out from the impasse.

Figure 8; **Evolution of Chilean export destinations**

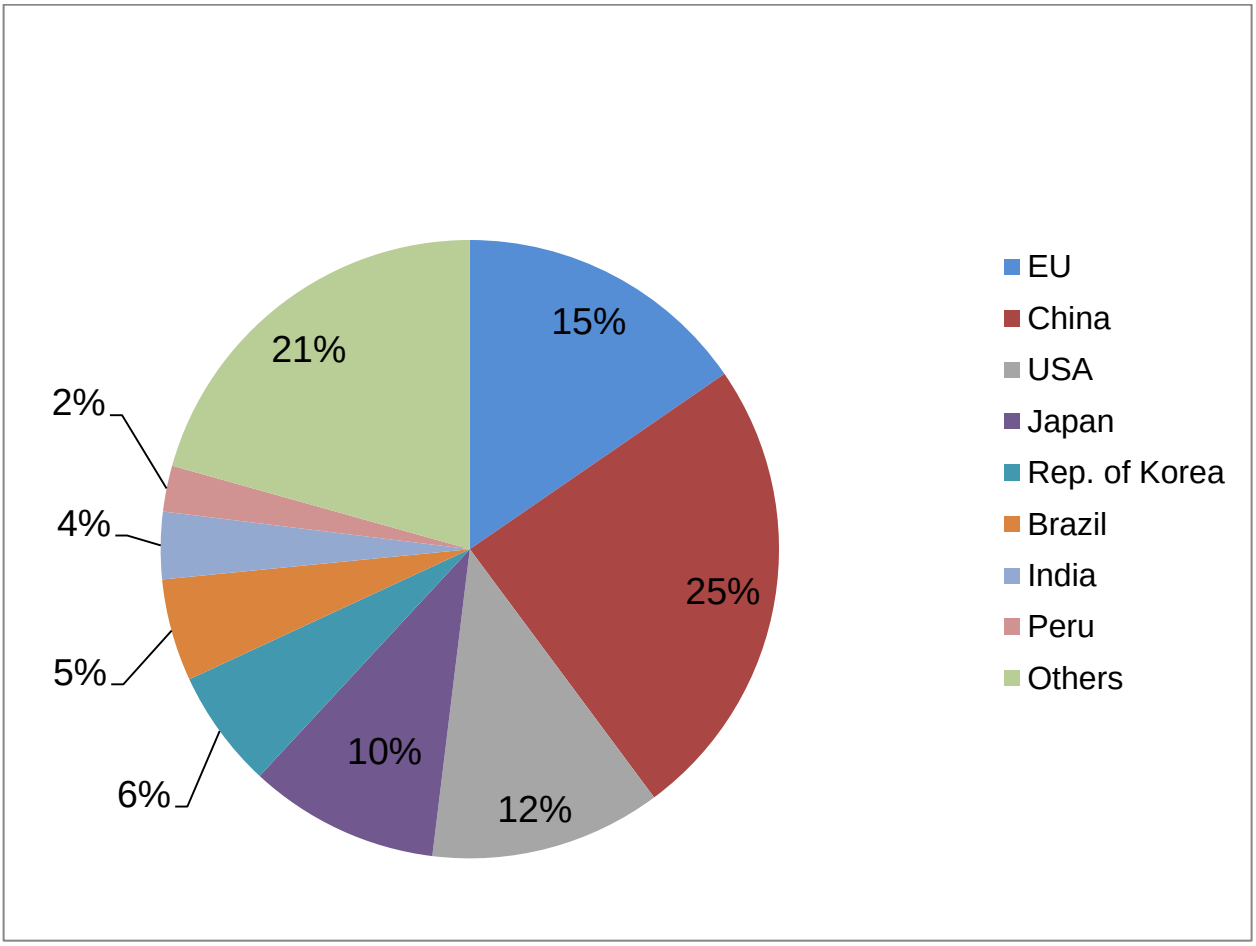


Source: CEPALSTAT

Chile has always tried to find new markets to diversify the destination for its goods. In doing so, Chile lower the risk of external shocks that can occur in

economic crisis, therefore creating a stable and reliable network for the export sector of Chile.

Figure 9; **Destination market for Chilean exports, 2014**



Source: CEPALSTAT

Chapter II: A TradeCAN Analysis of Chilean Agricultural Competitiveness and Wine Industry

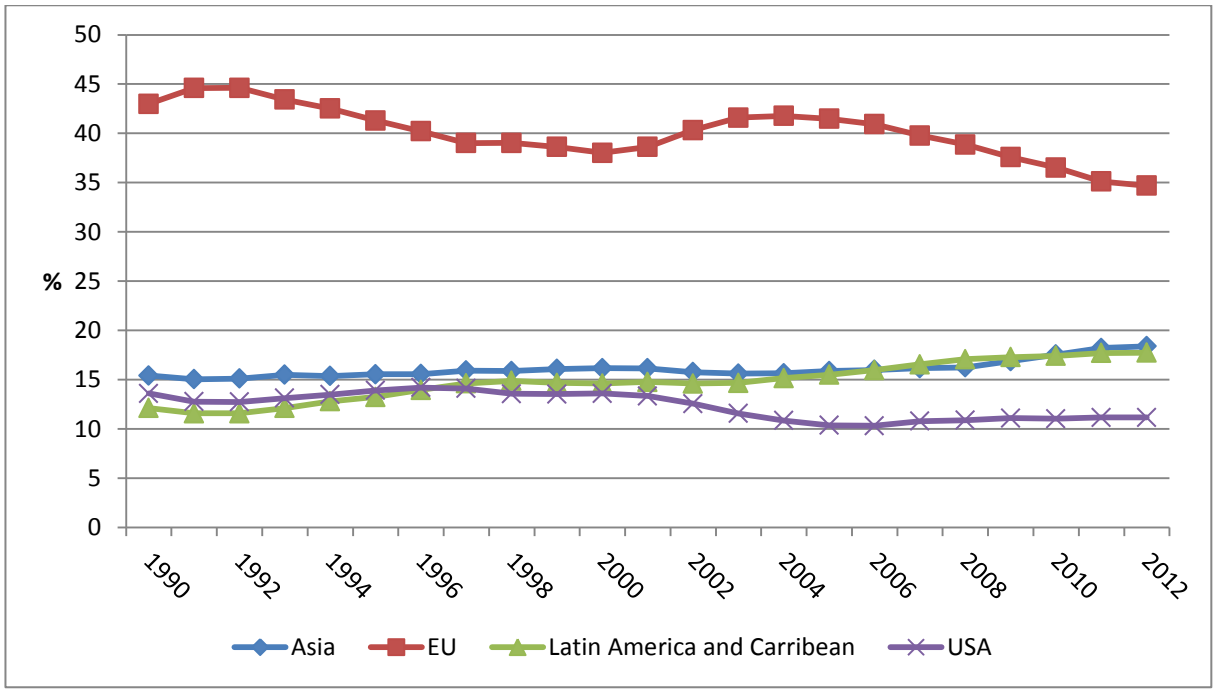
2.1 Market share and competitiveness: Latin America vs the other regions

Industrialized countries are the dominant players in agricultural markets and have been so for the past fifty years. Their share in global agricultural exports increased steadily between the early 1960s and 1990s (WTO, 2014). However, in the early 1990s they started to lose market share, while developing countries increased their share in world agricultural trade from 15% to around 20% in recent years.

Figure 10 illustrates that the share of developing countries in global agricultural trade was only slightly higher in 2012 than it was in the early 1990s. It also shows that the increased market share of Asia and Latin America in recent years mainly reflects a dramatic market share loss for the "western economies" (about -10% for EU and -5% for USA).

The negative trend in the market share of EU and USA is due to several factors: according with the World Trade Report of 2014 (WTO, 2014), technological change and changes in production and distribution processes have contributed to modernizing parts of the developing countries' agricultural sector in recent years. Therefore, developing countries became more competitive in the world market and increased their market share. Another factor likely to have affected agricultural productivity and export trends, notably in the 2000s, is Foreign Direct Investment (FDI). Recent reports suggest that increased global food prices have significantly affected investment interests (Deininger et al., 2011). For instance, in Asia and Latin America agriculture was the second most promising sector for attracting FDI, behind the food industry, which was ranked number one among potential FDI interest (WTO, 2014).

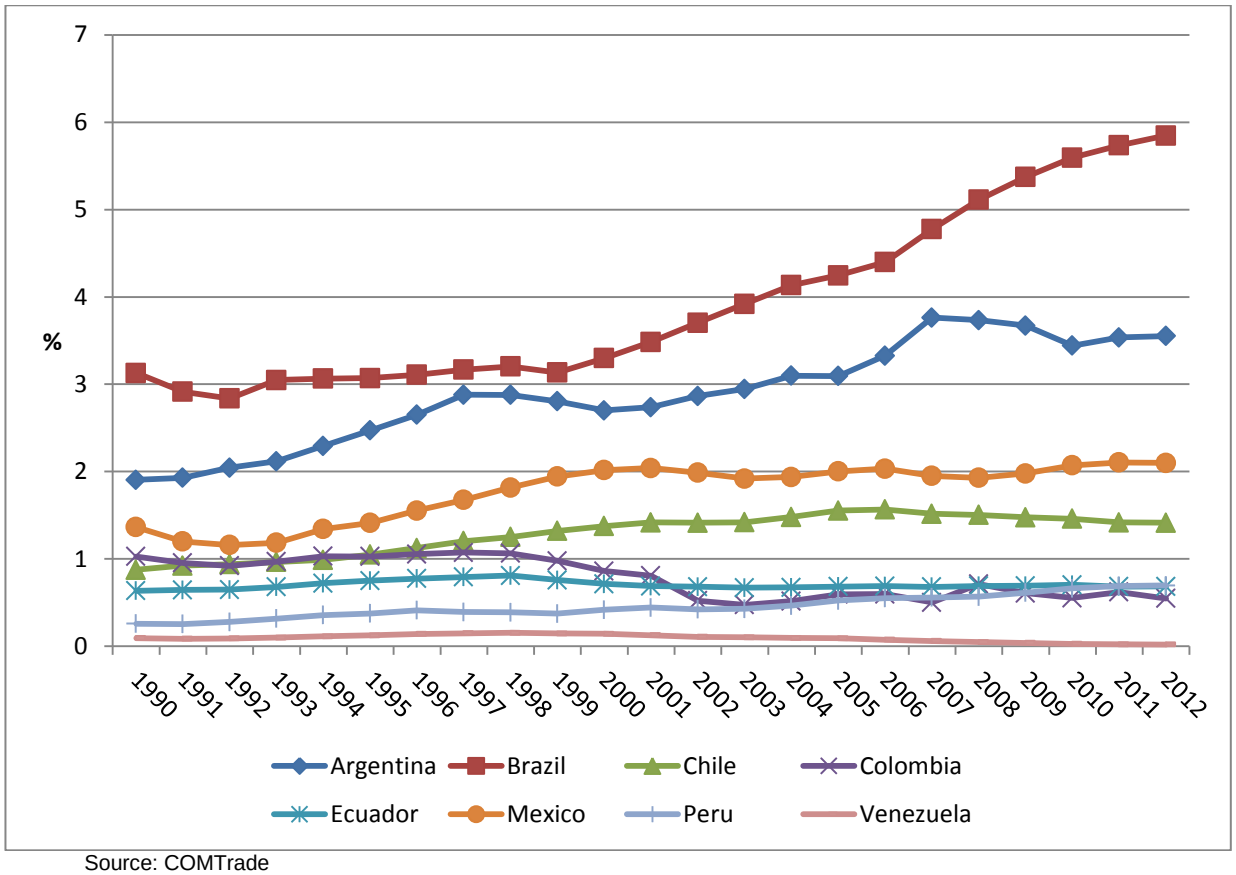
Figure 10; **Market share of the agricultural sector – macro regions**



Source: COMTrade

The changes in agricultural trade described above have impacted developing countries in different ways, depending on their competitive position. Some countries have managed to enter the growing processed food market (e.g. China) while others have increased their contribution to the growing fresh fruit and vegetable segment (e.g. Chile) (Timmer, 2009).

Figure 11; **Market share of agricultural sector – Latin America**



Source: COMTrade

Looking into the sectoral competitiveness inside the Latin American region, figure 11 shows the evolution of the agricultural market share of the most important regional players.

The top three is composed of Brazil and Argentina, first and second respectively, and then Mexico with a notable gap from the first two. Overall, Brazil had the biggest market share in agricultural products, showing an impressive and steady growth in market share after 1999 after a turbulent period at the beginning of the '90s. The impressive growth in market share of the Brazilian agricultural sector after 2005 is due mainly to the growing importance of its grains (rapeseeds mostly, but also barley and durum wheat) and its bovine meat on the world market (from COMTrade data).

On the other hand, Argentinean agricultural products performed well in the world markets during the first part of decade, but the Asian Crisis of 1997 had a big impact on its exports. Argentina started to gain market share again in 2000, also due to the super cycle of commodities (palm oil, cocoa beans, rapeseed and poultry performed really well between 2005 and 2008).

Mexico, after a difficult start in the ‘90s, showed a sound growth in market share during the second part of the ‘90s basically due to the export boom of Mexican grains (durum wheat and barley) and nontraditional agricultural products like olive oil and coconut oil (COMTrade data). Mexico has faced ups and downs in recent years, but shows a positive trend since 2009.

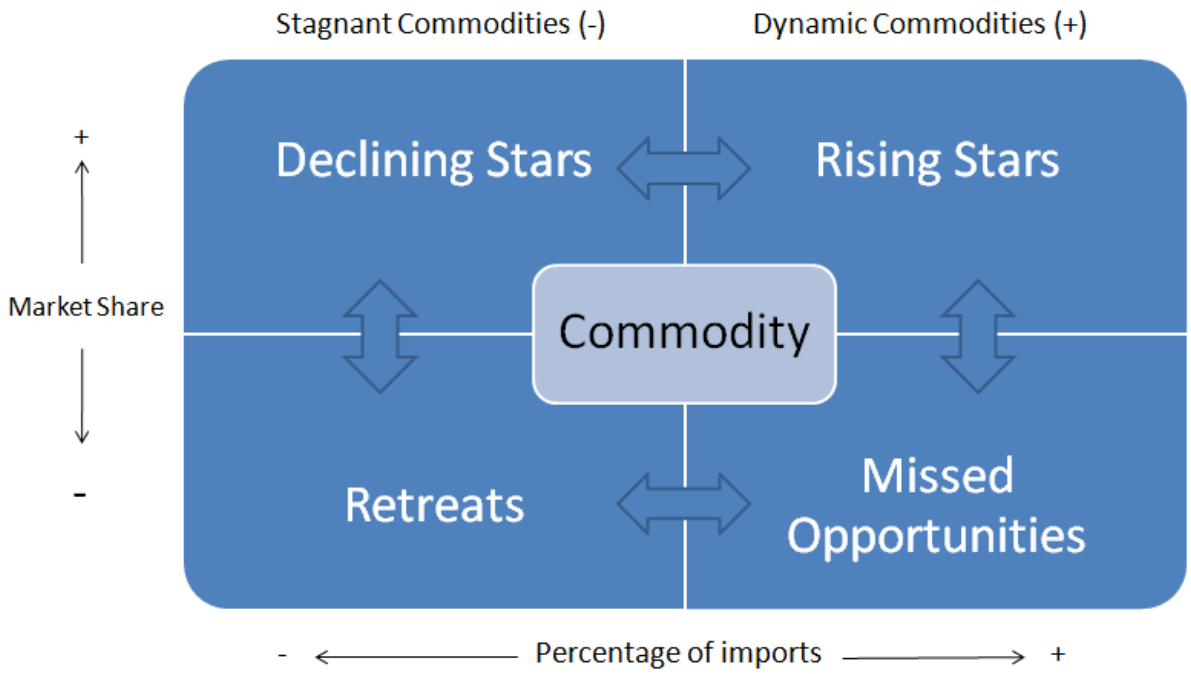
After the big three, there is Chile, a country that started with a low market share of its products but was able to increase its importance in the world market until 2006, due to its sound and resilient economy, the implementation of good trade policies, and its comparative advantages in agricultural production (Timmer, 2009). Products like rice, sugarbeet and pork meat played an important role in gaining market share in the international market (TRADECan analysis). However, since 2006, the agricultural products of Chile have started to lose importance, due to strong competition of Brazilian products in the Asian markets (FAO, 2010).

On the other hand, Colombia didn’t follow the same path as Chile. During the first part of the 1990s it was in a similar situation as the Andean countries, but due to its fragile economy, was susceptible to external shocks that affect the competitiveness of its agricultural sector (FAO, 2004).

The agricultural sector of Peru showed a similar trend to Chile, showing good performance in recent years. Ecuador and Venezuela also have a stable position in the world market over the period considered in the analysis.

2.2 The competitive matrix of Chilean agricultural sector

Figure 12; **The competitiveness matrix**



TradeCAN is a softaware developed by ECLAC in association with the World Bank, consisting in a comprehensive database of several import markets, a powerful query form, and a useful report. It is designed to analyze national and regional competitiveness in commodities and manufactures exports. It allows users to calculate market shares and the specialization index for each three- or four- SITC[3] digits between 1987 and 2013 and to plot changes in market share and market structure.

TradeCAN also helps calculate market positioning, which is drawn from the business literature and intends to show how a country is placed for growth in world markets. It relates product-level market shares to the dynamism of exported products in world trade.

TradeCAN data come from the COMTRADE database, the official trade database maintained by the United Nations Statistical Office. The competitiveness

[3] Standard International Trade Classification

was analyzed with the use of indices of sector participation and market share using ECLAC's Competitiveness Analysis of Nations methodology (CAN).

TradeCAN is based on the Competitiveness Matrix developed by Mandeng(1990) and Fajnzylber (1990) (figure 12).

On the Y-axis is used the market share[4]; a positive result indicates a gain in the market share for this particular exporter related to the chosen commodity. A negative result indicates a market share loss.

The variable on the X-axis (percentage of imports [5]) separates dynamic commodities from stagnant commodities: "dynamic commodities" are commodities that increase their importance in the market over time (e.g. imports of this commodity have increased faster than total imports); "stagnant commodities" are such as commodities that are losing (or no changing) importance into the market over time (it's, of course, the demand for that commodity on the import market that is stagnant). The "percentage of imports" depends solely on the import market, the aggregation level, and the time period.

The combination of both variables opens four possibilities that constitute the "CAN typology of competitive situations".

- Rising Stars: when the exporter gains market share in the world market for the considered commodity, and at the same time this commodity gains importance in the market.
- Declining Stars: when the exporter gains market share in the world market for the considered commodity, and at the same time this commodity is losing importance in the market.
- Missed Opportunities: when the exporter loses market share in the world market for the commodity considered, and this commodity is increasing its importance in the market.
- Retreats: when the exporter loses market share in the world market for the considered commodity, and at the same time this commodity is losing importance in the market.

[4] See the Appendix for more details.
[5] See the Appendix for more details.

It's ideal for the highest share of exports to be Rising stars, where the country is gaining market share in fast-growing products. Missed opportunities are the least desirable, since market share is lost in dynamic products. Declining stars are undesirable, since market shares are rising but not in the dynamic products. Finally Retreat may be desirable if the movement away from stagnant products is accompanied by growth in dynamic products.

The analysis is subdivided in three periods: the first one, between 1989 and 1997(year of the Asian crisis); the second one between 1997 and 2005 (between the Asian crisis and the super cycle of commodities), and the last one (2005-2013) that represents the most recent developments.

Figure 13 resumes the export performance of Chilean agricultural products[6] according to the categories of the Competitiveness Matrix subdivided by the three periods mentioned above.

- 1989-1997: Chile, during this period, was competitive in agricultural commodities that were losing importance in the world market, with more than 50% of its products under the category Declining Stars. However, a good number of commodities were "Rising Stars" (18.5%) like wine, olive oil and tobacco. Finally Missed Opportunities and Retreats accounted for 6.7% and 21% of the total, respectively. In other words, the agricultural sector was really polarized in products that were losing importance in the market, resulting in poor competitiveness in the international markets.

- 1997-2005: it can be noticed a transfer of many "Raising Stars" and "Missed Opportunities" to the "Retreats" group (44.5% of the product analyzed, a double compared to the previous period).This period was characterized by rapid structural change within the sector, showing a duality of the Chilean exports: on the one hand, a considerable number of Chilean products switched from Missed Opportunities group, which is the less desirable category, to other categories; this should be seen as a positive fact. On the other hand however, this was not accompanied with a growth in dynamic products (Rising Stars). Therefore, the overall agricultural exports were minimally competitive on the international market. This scenario is worse than the previous period; as the process of diversification towards commodities with higher income elasticity and technological contents had not been achieved in this period (Cimoli & Di Maio, 2004). Furthermore, the Chilean agricultural sector lost the huge opportunity to take full advantage of the favorable external conjuncture (commodities super cycle). Chile, at the end of this period, was forced to face a de-specialization in stagnant commodities in order to promote specialization in dynamic commodities.

[6] See Annex 2 for the complete list of products.

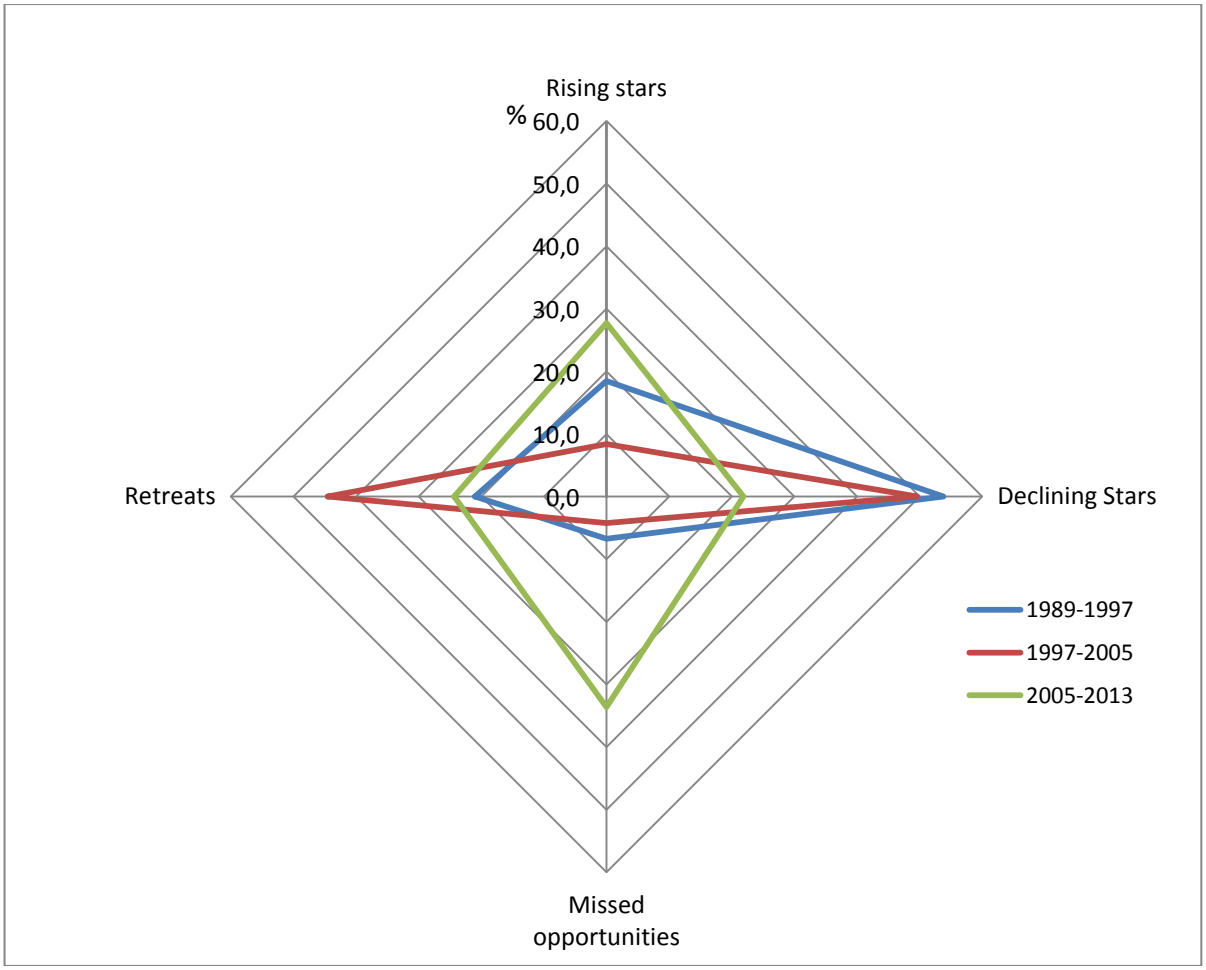
- 2005-2013 (see Annex 2): in recent years, Chile improved its performance on the international market. As shown in Figure 13 and Table 2, many products that before were Retreats and Declining stars were redistributed in the other two groups. In other words, Chile finally increased its specialization in dynamic products.

  Rising Star products are the 27.7% of the total (before just the 8.4% of the products were in this category, see Table 2). However, also a considerable number of products are in the Missed Opportunities group (33.6 % of the total).

  Like the period before, Chilean agricultural products faced a duality of their competitiveness on the international market. A lot of products now are in the undesirable category of Missed Opportunities (for instance maize, durum wheat, tobacco, etc); this is accompanied with good number of agricultural products that have shifted in the Rising Stars group (berries, pork meat, milk, honey, sesame and sunflower seeds). This compensated the market share's loss in products that actually are gaining importance on the market, showing a positive trend in terms of competitiveness for the Chilean agricultural exports.

  Surely, this opens the possibility that wise agricultural policies can boost the sector as an engine for the whole economy.

Figure 13; **Evolution of agricultural exportations according with the competitive matrix**



Source: COMTrade

Table 2; **Resume table**

	1989-1997	1997-2005	2005-2013
Rising stars	18.5%	8.4%	27.7%
Declining Stars	53.8%	49.6%	21.8%
Missed opportunities	6.7%	4.2%	33.6%
Retreats	21%	44.5%	24.4%

2.3 The wine industry exports and its competitiveness

Chile has steadily developed comparative[7] and competitive advantages[8] to become an important producer and exporter of a wide variety of products associated with the agricultural sector.

The relative success of the Chilean economy is due to the application by the government of exchange rate and market liberalization policies oriented towards the promotion of exports in both traditional and non-traditional sectors, in order to turn them into an engine of growth (Lacayo R., Morales C., 2007).

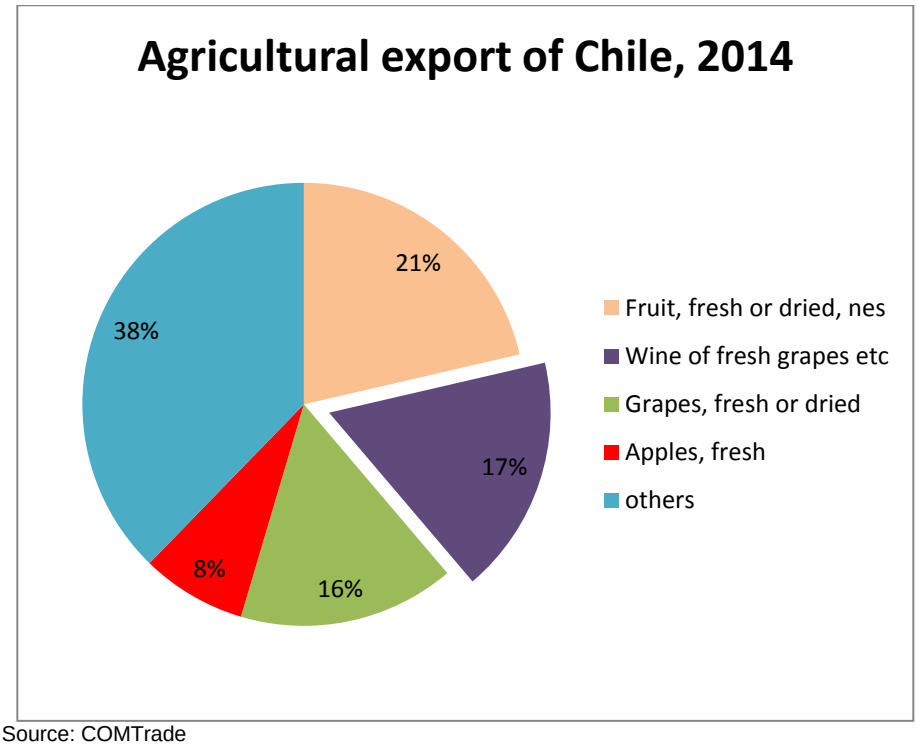
Moreover according with CORFO (2005), the sector benefited from some comparative advantages that played an important role in terms of competitiveness: natural factors such as cost and quality of land and water resources, climate diversity, natural environmental protection, opposite seasonality with the northern hemisphere, and cost and productivity of the workforce. Regarding competitive advantages, it should be mentioned sanitary conditions, experience in international markets, bilateral and multilateral agreements, both signed and under negotiation, favorable investment climate, and Chile´s prestige as a competitive, quality and reliable supplier in the agricultural sector. Currently, Chile is among the top 20 food exporters in the world, with exports close to US$ 8329.8 million in 2013 (ODEPA, 2013).

Figure 14 presents the export composition of the agricultural sector of the country for the year 2014. Notably, fresh and dried fruits account for the 21% of the total value of the agricultural exports, playing an important role in the Chilean export basket. Wine accounted for 17%, while table grapes and apples are 16% and 8% respectively. The other products accounted for 38% of the total, but with high fragmentation (more than 20 products are contained in “others”), that resulted important but not key drive in the exports basket.

[7] Comparative advantage is the ability of a firm or individual to produce goods and/or services at a lower opportunity cost than other firms or individuals.

[8] Competitive advantage is a business concept describing attributes that allow an organization to outperform its competitors. These attributes may include access to natural resources, such as high grade ores or inexpensive power, highly skilled personnel, geographic location, high entry barriers, etc.

Figure 14; **Agricultural export of Chile, 2014**



Source: COMTrade

Chile is one of the wine producing countries in the world with the highest relative importance of wine in the exportation basket (see Annex 1) and it's highly specialized in wine production according with the TradeCAN specialization index (Table 3).

Table 3; **Wine's specialization Index**

	1990	**1995**	**2000**	**2005**	**2013**
France	9	8.2	8.4	8.4	10
Italy	4.2	4.8	5.4	6.1	8.5
Spain	5.3	5.3	5.3	5	6.6
Australia	1.5	3.3	7.8	11.5	4.1
Chile	**3**	**7**	**15.2**	**10.8**	**13**
Argentina	0.9	1.3	2.7	3.9	6.7
USA	0.14	0.23	0.41	0.42	0.56
South Africa	0.4	2.5	3.8	5.2	3.6
New Zealand	0.7	1.4	3.2	8.4	16

Source: TradeCAN

In order to understand that wine is a key product for the Chilean exports, it necessary to show the alcoholic beverage sector composition and its competitiveness.

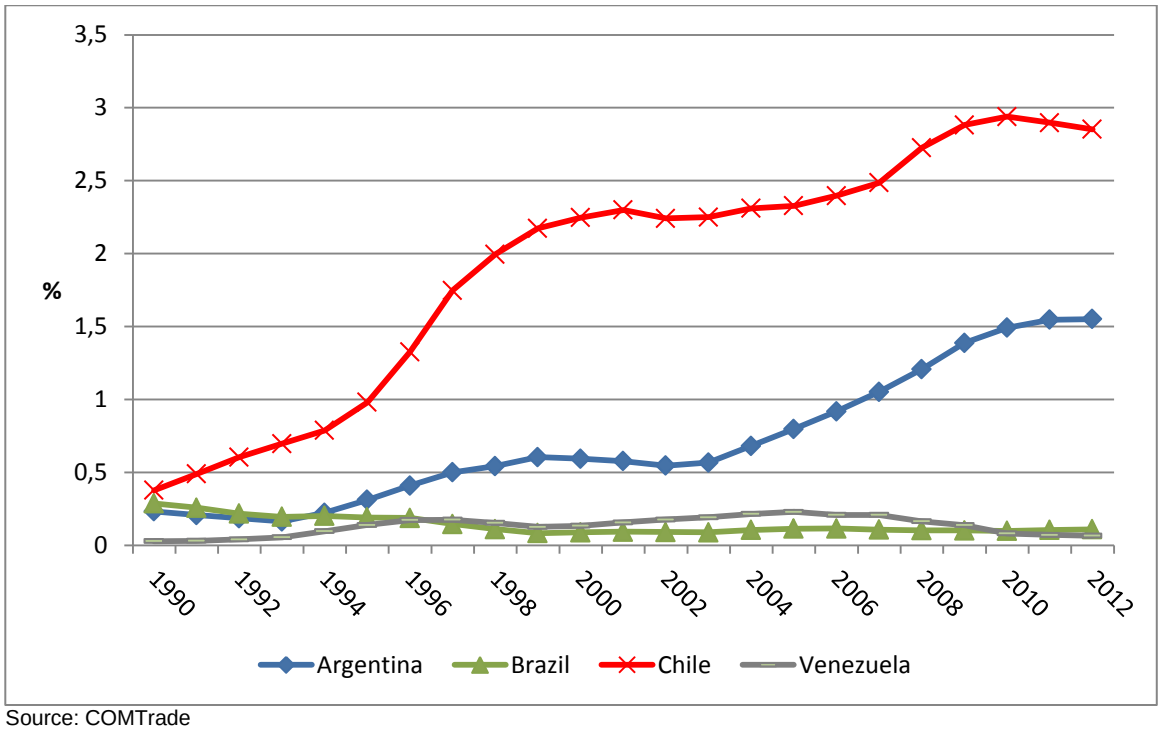
Figure 15 compares the sectoral market share of the most important market players of Latin America; Chile and Argentina are the most relevant countries of the region and they show a matched market share growth over the years.

Chile's alcoholic beverage sector share reached its peak in 2010, accounting for 2.95% of the world market share and almost double than the Argentinean sector in the same year.
However, the historic trend of market share was not always positive for the two countries; after an impressive boom during the 1990s, the sector started to lose energy during the first part of the 21st century.

After three years of weakness on the international market, in 2003, the Argentinean sector started to grow quite fast, whereas the Chilean one appeared tired. However, the Chilean sector became competitive after 2008, as the economic crisis affected the western countries. This remarkable turnaround was due to several factors. The most important factor is related to the paradigm of the Chilean alcoholic products; they are known worldwide as "good and cheap" and, for this reason, can gain market share in countries where the consumers have less money to spend in luxury goods like wine and other premium alcoholic beverages (Anderson K. et al., 2004).

With the escape from the economic crisis for most of the western economies in 2010, however, the consumers prefer more expensive alcoholic products, therefore the Chilean and Argentinean alcoholic beverage sector has lost market share again, accounting for 2.85% and 1.55% of the total market share respectively in 2013.

Figure 15; **Market share of alcoholic beverage sector**

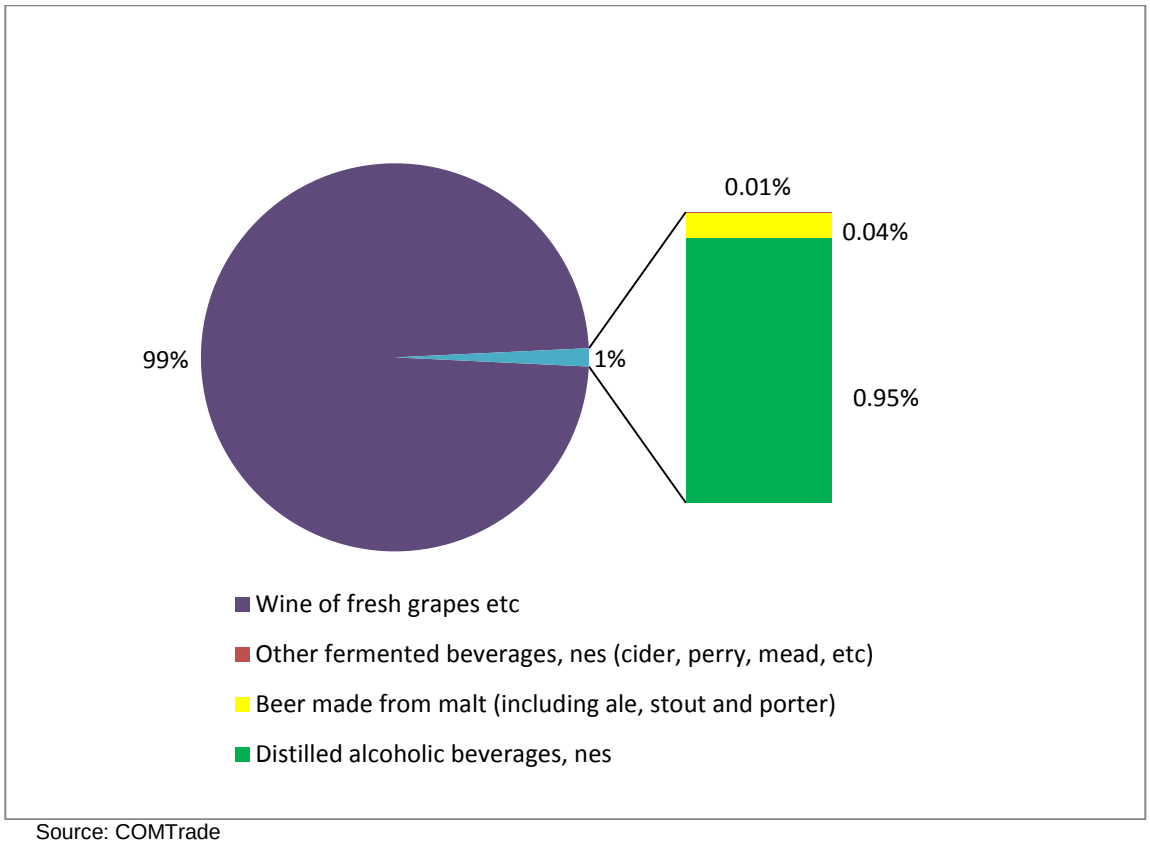


Source: COMTrade

But, how is the sectoral export matrix of Chile composed? Does really wine play a key role in sectoral exports?

Figure 16 addresses these questions by showing that in 2014, 99% of the alcoholic beverages exports was wine and just the 1% of the sectoral exportation was composed by other products (beer, spirits and other fermented beverages). Therefore, wine is undoubtedly a key product for both the alcoholic beverages sector and the agricultural exports in general, underlining the strategic importance of wine and the wine industry for the active contribution to the Chilean economy.

Figure 16; **Export structure of the alcoholic beverage sector, 2014**



Source: COMTrade

2.4 A comparative analysis with other wine producing countries

For historical reasons, wine was mostly related to European countries during the past centuries. However, due to an unavoidable globalization process, since the end of the '80s other countries entered in the wine market with really interesting outcomes in recent years.

France, Italy and Spain have traditionally represented the most important wine producing and exporting countries, but also the primary wine-consuming countries (Farinelli, 2014) (Table 4).

Table 4; **Per Capita Wine Consumption, 2012**[9]

France	47.7 liters/year
Italy	37.1 liters/year
Spain	19.9 liters/year
Argentina	24.4 liters/year
Chile	15.5 liters/year

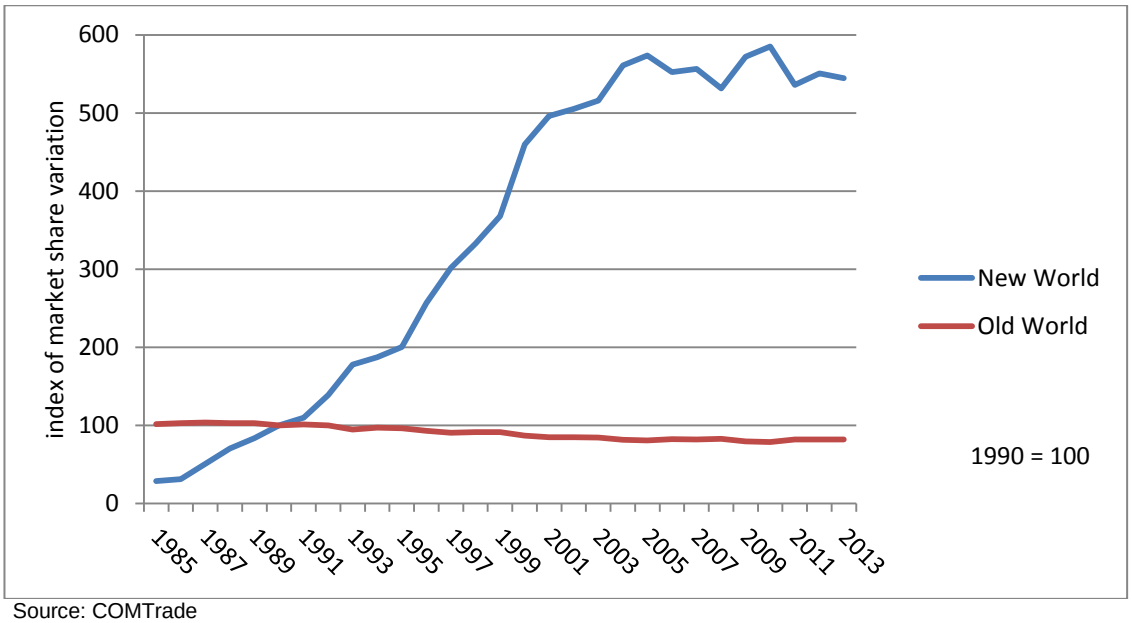
Since the 1980s, this situation has gradually changed. Farinelli argues that: “The transformation of wine from a standardized product into a highly diversified product, with increasing value-added content, was accompanied by the aggressive entrance into the international wine market of a number of so-called “New World” producers, led by Australia and the United States. Quite surprisingly, these managed to enter an industry that was traditionally dominated by the presence of a few countries with a winemaking tradition of more than twenty centuries, despite their lack of history and the fact they did not enjoy the same high-quality image of their established competitors (especially France)” (Farinelli, 2014).

Figure 17 presented the market share evolution of world’s wine producers and explained clearly what Farinelli said above; it presents the aggregate trend of the “Old World” producers composed by France, Italy and Spain, versus the “New World” composed by USA, Argentina, Australia, Chile, New Zealand and South Africa. The Old World is showing a slight downtrend over time, while the New World increased its presence on the international market steadily.

Although, the Old World has led the wine market in the past 25 years; in 1990, France had more of the 50% of the total market share; Italy was close to the 20% and Spain the 8%; in the same period, the New World producers started to enter into the wine markets, leading to radical changes in market composition (Figure 18).

[9] Source: OIV, 2013

Figure 17; **Trend in wine market share: Old World vs New World**

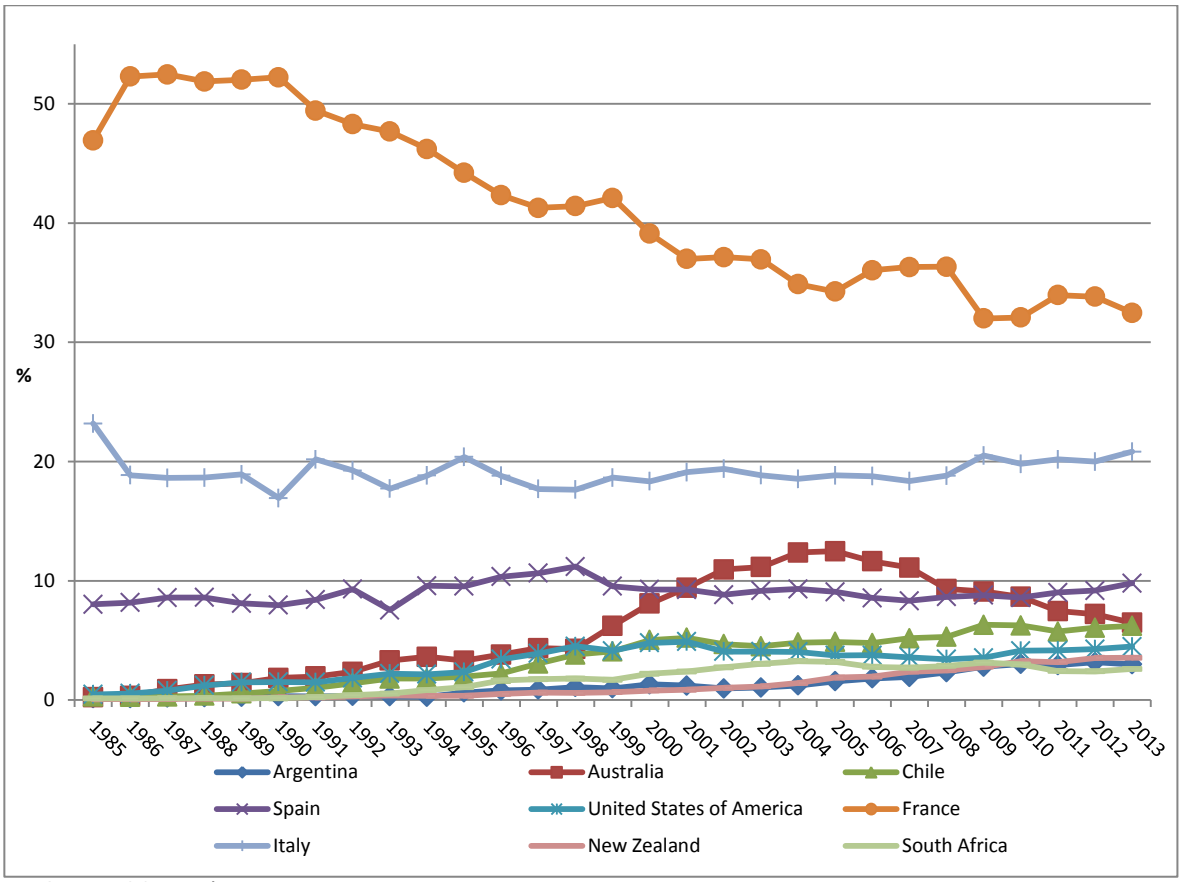


Source: COMTrade

The first thing that should be noted is the dramatic loss of French wines into the world market since 1990. France lost 20% of its market share between 1990 and 2013. After all, currently France is still the most important player of the group, but suffered more than Italy and Spain did in the competition with new players into the wine's world market.

In the meantime, Spain and Italy did not really suffer with the presence of new competitors. On the contrary, Italy and Spain gained 2% and 1%, respectively, of market share during the world economic crisis of 2008-09. However, the entry on to the international stage by New World producers has presented and will continue to present some serious challenges to producers in the Old World.

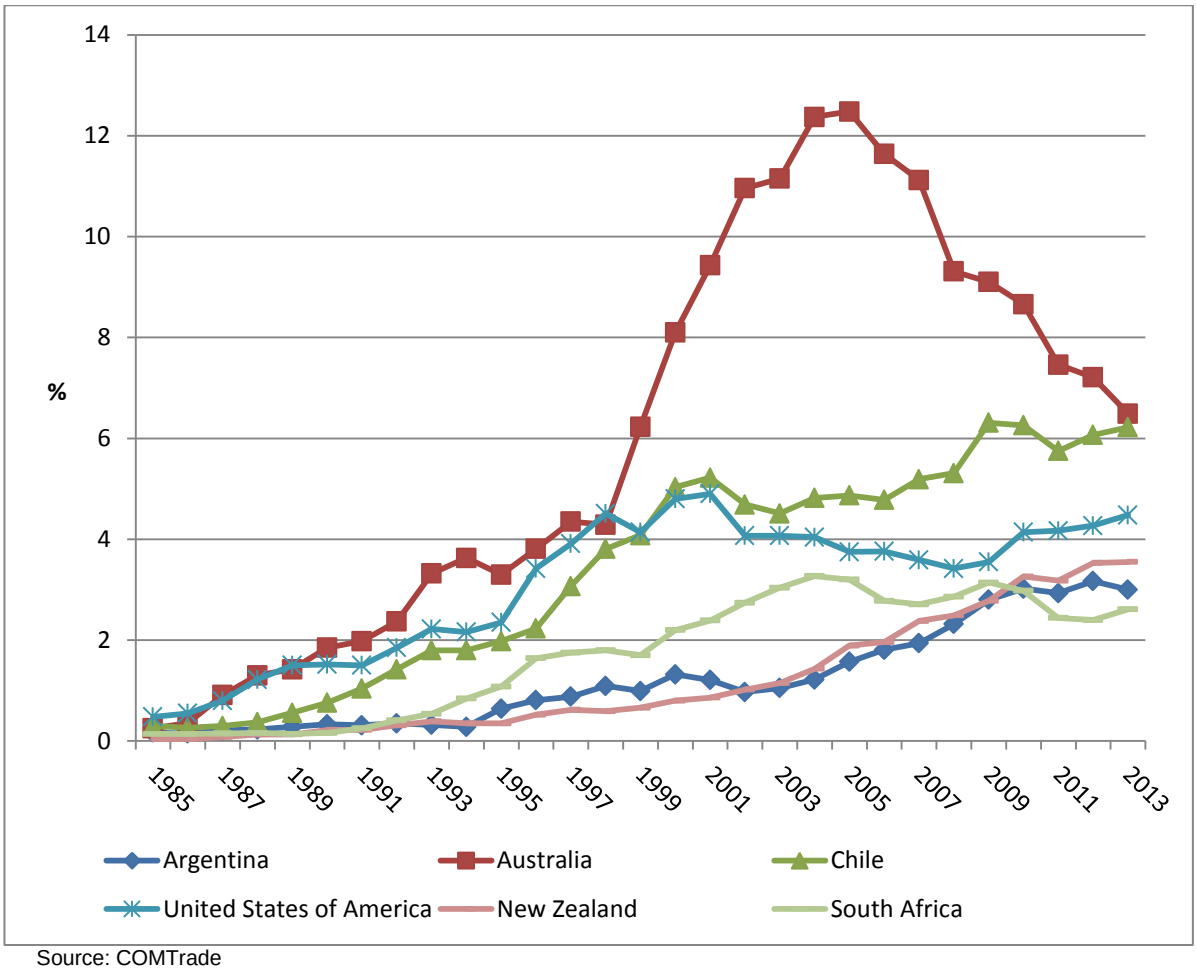
Figure 18; **Market share of wine producing countries**



Source: COMTrade

Surely the New World producers benefited from their comparative and competitive advantages to being competitive on the market in the short term. In this group, Australia and Chile mainly took advantages from the French downturn (figure 19).

Figure 19; **Market share of New World wine producing countries**



Source: COMTrade

Australia led the group of the New World producers with a share's peak of 12% in 2005. Unfortunately, a mix of factors led Australia to a brutal market share downturn since 2005. According to Mike Veseth from the Wine Economist (2009), Australia suffered an overproduction crisis that, as a consequence, has created a serious price crisis of Australian wines. He affirmed that the problem is deep and structural, and can be solved only with public policies that foster the scrapping of surplus capacity. On the other hand, serious drought problems in the Australian wine regions compromised the production of vine grapes in many regions (Wittwer G., 2008). This had two possible reading keys: on the one hand, this fact somehow can compensate the heavy overproduction of the country, but on the other hand, the quality of the production is also affected. Therefore, production of good quality grapes is compromised, as well as the market availability of the finest Australian wines. These factors led Chile to pass Australia in the world's wine producing countries rank in terms of value and volume of production in 2014 (see Chapter 3).

Chile can be seen as an emblematic case, showing a slower but steadier growth of importance in the international market over the years. Especially during the world economic crisis of 2008, a country like Chile met a good increment of importance in the world market, reaching its historical top market share of 6.31% in 2009. The key factors of this success will be analyzed in depth in the Chapter 3.

The USA is the only producer of the New World group that is situated in the Northern Hemisphere. US wines performed well between 1990 and 1998, and then downsized at the beginning of the new century. American wines became competitive only after 2009, with an increase of market share from 3.55% to 4.48%.

New Zealand, Argentina and South Africa are positioned respectively seventh, eighth and ninth on the world wine market according with their market share. They surely benefitted from the French impasse and all together covered a substantial part of the New World producer' market share (almost the 10% of the total). Furthermore, New Zealand and Argentina showed a positive trend, slowly gaining market share due to high quality products and effective marketing strategies in key markets such as UK and USA (L. King and S. L. Forbes, 2013; Veseth, 2009).

On the other hand, South Africa faced difficulties reaching the consumers due to lack of investments in country promotion, marketing and a near-zero Foreign Direct Investments (FDI) in the last two decades (Francoise Botha, 2010). South African' wines are popular in UK, Sweden and Canada, but far away from the competitors' level. South Africa holds the smallest market share of the group, showing a negative trend in recent years.

The results show a high level of competitiveness of agricultural exports and an increase in comparative advantage for products such as wine for the New World producers. In this group, Chile showed a good level of specialization and high competitiveness in the international market. Moreover, the high volatility in competitiveness contributes to the idea that wise sectoral policies may have positive effects for the Chilean wine industry and the whole economy in general.

In the end, this chapter revealed an increase in market share in the world's wine market. Despite the aggressive entry of New World producers, the forces of tradition are very strong, and European countries continue to lead the world wine industry, with Italy and France dominating the wine world markets. Europe, however, has lost ground with respect to all the most important wine market indicators, in favor of emerging producers located mostly in the Southern Hemisphere.

Chapter III: The Chilean Wine Industry

3.1 History and recent developments

Chilean wine started to be known around the world only after 1990, but the viticulture of this country began more than four centuries ago.
Early chronicles bestowed on a religious person, the Spanish Don Francisco de Carabantes, the honor of having introduced the first vine to Chile in 1548 (probably a variety originated from Spain or Italy) (Anderson et al., 2004). Due to religious uses, other priests started to cultivate the same grapevine variety around the country.

In 1551, Don Francisco de Aguirre planted the first vineyard in Copiapò, in the north of Chile, where he started a process of breeding to establish a variety known as “Paìs” (del Pozo, 1998). Due to its adaptability to adverse conditions and indifferences to harvesting delays it was to become the most common vine cultivated for centuries in Chile. Lately, this variety has arrived in Argentina and California, where it is known as Criolla and Mission respectively.

Even if, the first variety of grapevine was introduced by Spanish priests for religious purposes during the conquest of the territory, it is more than two centuries later that the Chilean winemaking had its turning point.

In 1830, the Frenchman Claudio Gay began the first agricultural experiment station in Santiago, introducing new varieties of plants from Europe, including many French vine varieties. However, only with Silvestre Ochagavia (1851) that started to replace older rootstock with finer French varieties brought by Gay, the Chilean wineries began to make the turn toward European wines (Hernandez, 2000). This was the emergence of the Chilean modern wine production.

During the 19th century, other winemaking enthusiasts (most of them belonging to Chilean aristocratic families; notably, Luis Cousiño, Ramón Subercaseaux and José Tomas Urmeneta) began to plant French varieties of Merlot, Cabernet Sauvignon, Malbec, and Syrah and so established most of large, successful wineries that continue to this day (e.g. Viña Cousiño Macul, Viña Errázuriz).

Production of finer wines grew constantly during the end of 1800 thanks to the employment of an increasing number of European experts, which the majority came from France (Anderson et al. 2004).

This process of betterment led Chilean winemakers to present their wines during the Vienna Exposition of 1873, the first time in an international context. As production rose from 51 million liters in 1875 to more than the double in 1883 (almost 110 million liters), the industry was forced to search foreign markets that could absorb its constant increasing of wine production. Exports to Europe began in 1877.

Chile was the principal producer and exporter to the region between 1875 and the first decade of the twentieth century with a peak of 275 million liters produced in 1903 (Hernandez, 2000).

In the same period, Europe and North America faced the most important threat in the viticultural history: the phylloxera. This pest dramatically changed the landscape of European wine production. One of the results of these tumultuous years was the disappearance of Carmenere variety from the Old World's land.
It was only in 1994, when the French oenologist Jean-Michel Boursiquot came to Chile and noticed that some Merlot vines took an unusually longer time to mature, that the suspect that could be the lost variety of Carmenere appeared eligible (Hernandez, 2000). Further analysis declared that was the old variety of Carmenere originally from Bordeaux, France; the variety that was believed to be extinct was rediscovered.

Even though there was a push for an outside market, between 1900 and 1930 Chilean exports of wine never exceed 6 per cent of production (del Pozo, 1998). The country's good growing conditions and the availability of imported technical talent from the Old World led to a consistent increase in production and to lower prices.
Under the pressure of the Chilean aristocracy (that owns much of the wineries at that time), in 1939 the Government established a new law to avoid new plantation of vineyards, regulated transplanting, and otherwise manage the production so as to limit domestic consumption to 60 liters per capita annually to avoid others "overproduction crisis" (Anderson K. et al., 2004).

This protectionism environment avoid further low-price crisis of Chilean wine sector but, as prices rooses, the consumption per capita fell dramatically (Hernandez, 2000). It was not until the turn toward open markets after the coup d'état of 1973, that the wine industry began to re-establish its dynamism.

Since the economic liberalization of 1973, the wine sector opened its doors to new foreign technologies and investors. This was the beginning of many

successful alliances and joint-ventures between domestic and international firms, such as Miguel Torres (Spain), Rothschild family (France), Robert Mondavi, Beringer Fetzer and Kendall-Jackson (USA).
This new wave of foreign capital has been successful both in terms of winemaking capacity and new vineyards plantation.

The recognition of potential profitability of Chilean wine exports had a big impact on the varietal landscape of Chile: from the beginning of the 1990s on, all the new plantings have been non-traditional varietals, most of them red wines, relegating traditional varieties like País and Semillon a marginal role, exclusively to internal market distribution (table 5; see Annex 4 for details).

Table 5; **Varietal landscape of Chile**

Variety	**Area (Ha)**				**Δ%**
	1994-1998	1999-2004	2005-2009	2010-2013	1994-2013
Cabernet sauvignon	14715.2	36574.0	40305.9	40745.0	177%
Merlot	4423.2	12426.7	11897.8	11411.6	158%
Chardonnay	5064.6	7499.1	10252.0	10767.3	113%
Sauvignon Blanc	6324.0	7029.5	9868.2	13931.3	120%
Chenin Blanc	100.8	66.6	67.8	55.8	-45%
Pinot Noir	328.0	1366.3	1927.5	3777.1	1052%
Riesling	321.2	287.0	322.8	419.0	30%
Semillón	2565.0	1914.3	1356.1	928.0	-64%
País	15446.6	15078.8	10429.8	6880.1	-55%
Carmenère	748.5	5137.9	7678.2	10173.1	1259%
Syrah	262.7	2137.3	4257.7	7489.5	2751%
Cabernet Franc	73.0	779.7	1193.3	1480.1	1928%
Others	10695.8	14190.5	13451.2	17386.1	63%
Total	60485.2	104487.6	113008.3	125444.1	107%

source: Servicio Agricola y Ganadero, Gobierno de Chile, 2014.

The agronomic management of the Chilean vineyards was affected by foreign knowledge: French and Spanish agronomists and oenologists flight periodically from Europe to South America started a phenomenon of “flying

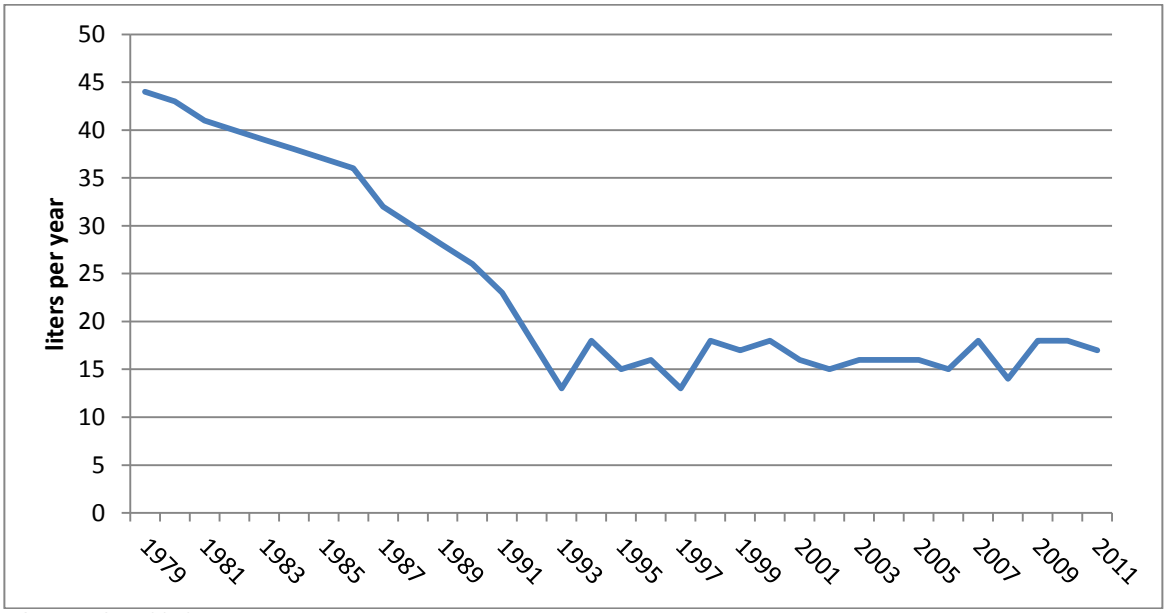
winemakers" (also American and Australian oenologists took part of this process) (Anderson K. et al., 2004). Undoubtedly, this had a big impact on Chilean viticulture, but also on wineries architecture: the wineries of the Central Valley were built taking inspiration from the concept of French "Château". Fancy wineries can easily welcome wine tourists, which is an important factor for the development of "rutas del vino" (wine routes) into the Chilean wine regions (del Pozo, 1998).

In addition to this "learn by others" process, as in other traditional wine producers countries, consumers in Chile have dramatically reduced their consumption of wine since the end of the 1970s (figure 20). The average personal intake of wine has halved in the past ten years. As a consequence, the attention on the foreign markets and tastes is due mainly because of the small size of the internal market.

What factors contributed to this decline? Anderson et al. (2004) argued that was mainly due to rapid economic development; with the rising of the middle class, the nature of the workday changed as well, and therefore the demand of alcoholic beverages.

But not only the volume of wine changed. The rising in consumer purchasing power led to a change in wine demand, from table wine assumed in large quantities to more sophisticated and expensive wines consume on special occasions.

Figure 20; **Per capita wine consumption of Chile**



Source: OIV, 2013.

Moreover, with import barriers lower, others substitute products such as beer and imported alcoholic beverages (e.g. whisky) entered massively into the Chilean market, with aggressive marketing campaigns that undermined the role of prime alcoholic beverage consumed in the country (Foster et al., 2000).

From the 1990 to now, per capita consumption has fluctuated between 23 and 16 liters per person per year, with the average of 17 liters per person/year in the period from 2010-2013 (ODEPA, 2015). This trend led the Chilean wine industry to strengthen the design of products for export, at the expense of those for the domestic market.

3.2 Production, prices and markets

3.2.1 National production capacity

Chilean annual production grew from 0.2 million hectoliters in 1990 to 12.8 million hectoliters in 2013, but fell to 9.9 million hectoliters in 2014 (SAG, 2014). Starting from a low base, the average annual growth rate was much higher in the 1990s (42%) than in the period from 2000 to 2013 (6%). This performance contributed to its ascendance from the 11th largest world producer in 2000 to the sixth largest producer in 2013 (see Table 6).

Table 6; **Top ten wine producing countries, 2000 and 2013**
(*Volume, percentage and rank*)

Countries	2000		Ranking	Countries	2013		Ranking
	1000 hl	%			1000 hl	%	
France	57 541	20.5	1	Italy	52 429	18.2	1
Italy	51 620	18.4	2	Spain	45 650	15.9	2
Spain	41 692	14.9	3	France	42 004	14.6	3
USA	21 500	7.7	4	USA	23 500	8.2	4
Argentina	12 537	4.5	5	Argentina	14 984	5.2	5
China	10 500	3.7	6	Chile	12 846	4.5	6
Germany	9 852	3.5	7	Australia	12 310	4.3	7
Australia	8 064	2.9	8	China	11 780	4.1	8
South Africa	6 949	2.5	9	South Africa	10 980	3.8	9
Portugal	6 710	2.4	10	Germany	8 409	2.9	10
Chile	6 474	2.3	11	Portugal	6 238	2.2	11
Romania	5 474	1.9	12	Romania	5 113	1.8	12
World total	280 373	85.2		World total	287 600	85.6	

Source: OIV, 2013.

But which segment the Chilean wine industry moved in the past two decades?

Figure 21 shows the evolution of wine production categorized in three different categories: wine with Designation of Origin (D.O.), wine without D.O. and bulk wine.

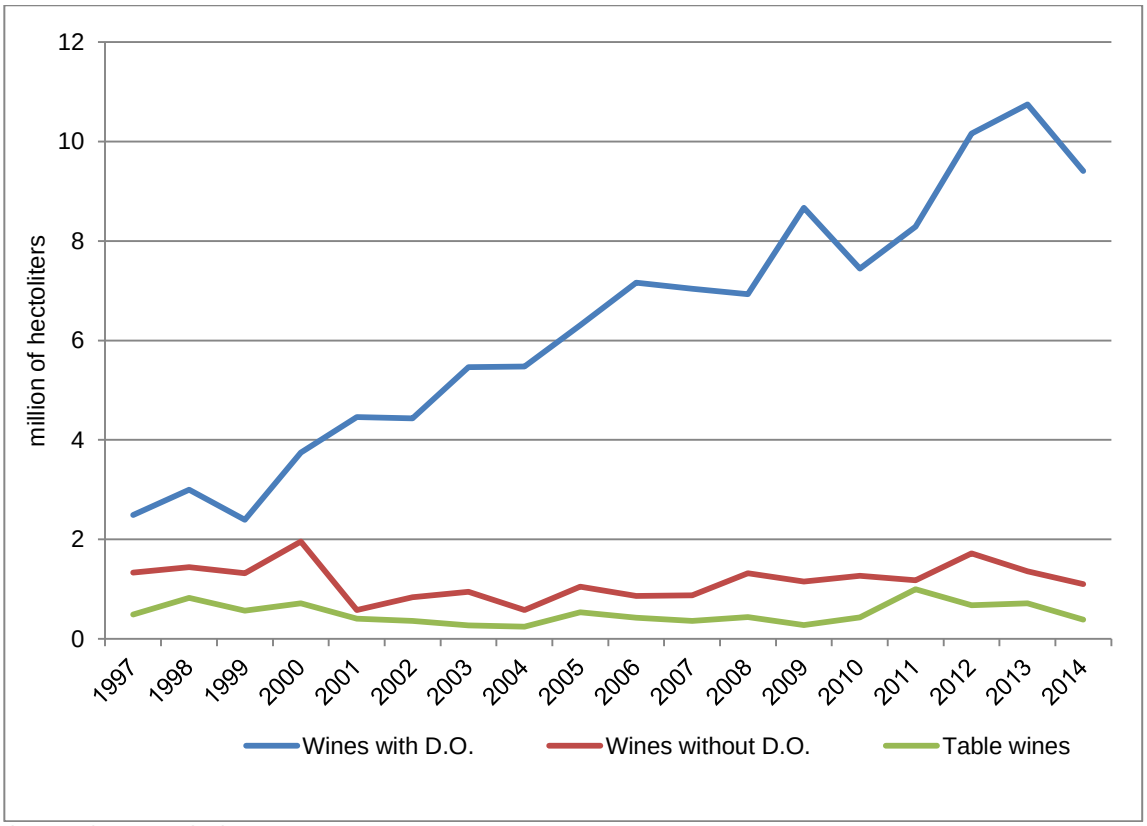
In 2001, the production of wines without D.O. and table wines fell considerably, with 42% of production loss of table wines, and even the 70% for wines without D.O..

This fact can be explained because of the nature of the Chilean wine industry; the winemakers are focused on producing wines that can be easily exported and D.O. wines are the most valued on the international market.

The production of wines with D.O. increased steadily between 2001 and 2008, with boom years in 2009 and 2013 (10.7 million hectoliters produced in 2013). According to ODEPA's annual report on viticulture (2011, 2014), these two growing seasons were characterized by ideal climatic conditions for grapevine cultivation (rainy winter, absence of frosts during the spring and dry and warm summer) that led to an unexpected good harvest of grapes (+20% in 2011 and + 23% in 2013 according with ODEPA (2014)).

Regarding wines without D.O. and table wines, the production started to slowly grow again over the last 10 years with a peak production of 997406 hectoliters of table wine in 2011 and 1.7 million hectoliters of wines without D.O. in 2012.

Figure 21; **Evolution of production by category**



Source: ODEPA & SAG

In 2014, the total wine production presented a decrease of 11% from the previous season, with more than 13% loss accounted by D.O. wines (Table 7). The fall in production was mainly due to the effects of a strong frost that hit the Central Valley in the third week of September 2013 (ODEPA, 2014).

Initially it was expected that this phenomenon affected almost exclusively the production of white varieties of grapes (Chardonnay and Sauvignon blanc lost 30% and 25% respectively compared to 2013). However, at the end of the harvest season, it was found that the frost affected the production of all varieties (especially Pinot Noir and Carmenere).

Table 7; **Stocks of wines Designation of Origin by variety**

Varieties	2012		2013		Variation (%) 2012-2013	2014		Variation (%) 2013-2014
	1000 hl	Share (%)	1000 hl	Share (%)		1000 hl	Share (%)	
Cabernet Sauvignon	3693.5	41.9%	4318.9	41.9%	16.9%	3867.3	42.5%	-10.5%
Merlot	1069.6	12.1%	1304.9	12.7%	22.0%	1210.5	13.3%	-7.2%
Carménère	939.0	10.6%	1141.4	11.1%	21.6%	994.7	10.9%	-12.9%
Syrah	669.6	7.6%	823.0	8.0%	22.9%	817.4	9.0%	-0.7%
Chardonnay	631.1	7.2%	713.9	6.9%	13.1%	494.5	5.4%	-30.7%
Sauvignon Blanc	800.0	9.1%	919.2	8.9%	14.9%	682.6	7.5%	-25.7%
Pinot Noir	206.5	2.3%	265.8	2.6%	28.7%	232.4	2.6%	-12.6%
Cot (Malbec)	147.3	1.7%	180.0	1.7%	22.2%	161.2	1.8%	-10.5%
Cabernet Franc	-	-	109.8	-	-	83.6	0.9%	-
Viognier	-	-	-	-	-	-	-	-
Others	661.1	7.5%	537.6	5.2%	-18.7%	553.7	6.1%	3.0%
Total	8817.6	100.0%	10314.6	100.0%	17.0%	9097.8	100.0%	-11.8%

Source: ODEPA and SAG.

The distribution of the production of wines with D.O. in 2014 showed, as in 2012 and 2013, that Cabernet Sauvignon was the predominant variety produced, reaching a share of 42.5%. It was followed by Merlot, which reached the 13.0% of share, and Carmenere at 11%; affirming the dominance of red grapevine varieties on the total wine production of Chile.

3.2.2 Evolution of prices and target markets

Chile also climbed in the ranking of major exporters in the world. In 2000, it was the fifth largest exporter, while in 2014 it was the fourth largest wine exporter behind France, Italy and Spain (see Table 8). This performance is quite impressive as the value of world exports almost tripled from 2000 to 2014. In the early 1980s, Chile's wine exports, mainly to the United States, were marginal (US$ 15 million). By 1993, its exports reached US$ 130 million when Chile started to infiltrate the EU market with its Cabernet Sauvignon wine.

Table 8; **Top ten wine-exporting, 2000 and 2014**
(*Value and rank*)

Ranking	**Countries**	**2000**	**Countries**	**2014**
		million US$		**million US$**
1	France	5 023	France	10 314
2	Italy	2 285	Italy	7 011
3	Spain	1 137	Spain	3 511
4	Australia	898	Chile	1 861
5	Chile	580	Australia	1 678
6	USA	523	USA	1 480
7	Portugal	467	Germany	1 367
8	Germany	350	New Zealand	1 123
9	South Africa	243	Portugal	971
10	UK	173	Argentina	842
11	Argentina	159	South Africa	799
12	Moldova	113	UK	754
	World	12 775	World	34 462

Source: COMTrade

Having a detailed overlook on the last three years, both 2012 and 2013 reported an increase in export volumes of Chilean wines, mainly supported by a significant variation in bulk wine exports in 2013 (+75% in

volume exported) (ODEPA, 2013). However, in 2013 bottled and sparkling wines had a reduction in volume exported of -4.1% and -14.8% respectively.

It is important to notice that the increase of exports of bulk wines is based on a significant sacrifice of selling prices (- 20% compared with 2012; see figures in Annex 3), showing that exporting wineries have preferred to choose a strategy of destocking. Primarily, with the purpose of making room in their warehouses and sell stockpiles quickly, allowing obtaining liquidity for the realization of new business (ODEPA, 2013). On the other side, the average price per liter of the bottled and sparkling wine increased slightly by +2% and +3.7% respectively.

In 2014, has shown an important decrease of 8.5% in total volume exported, mainly due to a drastic reduction of bulk wine exports (-21.7%) attributable to a reduction of demand of the US market (ODEPA, 2013). Bottled wine increased its volume exported by +7.8%, while sparkling wines performed really well with an increase of +21%. The average price of the total exported wine increased by +11,2%, driven by an increase of +3.9% in sparkling wine price. Bottled wine average price also increased by +1.85 showing a positive trend that continued from the year before. Lamentably, in 2014 bulk wine average price recorded another downfall of -2.5%.

Table 9 shows the most recent developments in volume, value and average price of wine exported.
In late May 2015, the total volume of exports of wines was 8.9% lower than the same month of 2014, also the value decreased by 12.6% compared with the year before.
The decline occurred in almost all categories, except sparkling wines, which showed an increase of 19.2% in volume and 18.4% in value.

Table 9; **Chilean Wine Exportation and Prices (2014 vs 2015)**

Volume (millions of liters)										
	2014	Cumulative 2014 vs 2015			Monthly comparison			Cumulative over 12 months		
		Jan-May 2014	Jan-May 2015	Δ %	May-14	May-15	% variation	Jun 13 - May14	Jun14 - May15	Δ %
Bottled wine	413.6	161.9	159.9	-1.3%	33.7	32.6	-3.3%	407.2	411.5	1.1%
Bulk wine	329.4	152.0	160.1	5.3%	36.6	31.7	-13.6%	368.0	337.5	-8.3%
Sparkling wine	4.1	1.2	1.2	-0.7%	0.2	0.3	19.2%	3.7	4.1	11.1%
TOTAL WINE EXPORTED	**806.6**	**338.0**	**341.6**	**1.1%**	**75.8**	**69.1**	**-8.9%**	**845.6**	**810.2**	**-4.2%**
Value (millions of USD FOB)										
Bottled wine	1 422.0	550.9	530.4	-3.7%	117.6	106.1	-9.8%	1 399.6	1 401.5	0.1%
Bulk wine	296.8	137.5	125.5	-8.7%	31.7	24.5	-22.9%	339.0	284.8	-16.0%
Sparkling wine	17.3	5.3	5.1	-2.5%	0.9	1.1	18.4%	15.6	17.1	10.0%
TOTAL WINE EXPORTED	**1 861.5**	**742.6**	**703.3**	**-5.3%**	**161.1**	**140.8**	**-12.6%**	**1 885.1**	**1 822.2**	**-3.3%**
Average Price (USD / liter)										
Bottled wine	3.44	3.40	3.32	-2.5%	3.49	3.26	-6.7%	3.44	3.41	-0.9%
Bulk wine	0.90	0.90	0.78	-13.4%	0.87	0.77	-10.7%	0.92	0.84	-8.4%
Sparkling wine	4.22	4.31	4.23	-1.8%	4.28	4.26	-0.7%	4.24	4.20	-1.0%
TOTAL WINE EXPORTED	**2.31**	**2.20**	**2.06**	**-6.3%**	**2.13**	**2.04**	**-4.1%**	**2.23**	**2.25**	**0.9%**

Source: ODEPA and Servicio Nacional de Aduanas.

Looking at Figures 1, 2 and 3 (Annex 3) one should note a general decrease in wine volume exported for all the categories in the first half of the 2015: as a consequence of this, bottled wine showed a decrease of -1.3% in volume and -3.7% in value; while bulk wine increased by 5.3% in volume and decreased by 8.7% in value. In doing so, this cancelled the good start that such exports had in the first two months of 2015, showing a very little progress or even reduction on what exported in the first half of 2014.

Observing Table 10 and 11 it is possible to address the explanation of these negative export trends of the first part of 2015.Table 10 showed a significant decline in exports of D.O. bottled wine to important target

markets such as UK, Netherlands and South Korean. Curiously, 2015 has shown a positive variation in volume of bottled wine exported to Brazil and Canada (+2.5% and +2.2%) but a decrease in value of 3.7% and 7.1% respectively. However, positive inputs arrived from Denmark, Mexico, Japan and, most of all, China, with a variation of +26.7% compared with the 2014.

Table 10; **Exports of Wines with Designation of Origin by country of destination**

Country	Volume (thousands of liters)				Value (thousands of USD FOB)				
	2014	Jan - May			2014	Jan - May			
		2014	2015	Δ 2015/14 (%)		2014	2015	Δ 2015/14 (%)	Share 2015 (%)
USA	38 183	15 348	16 326	6.4	148 892	58 431	63 999	9.5	12.1
UK	57 319	23 187	20 318	-12.4	177 486	72 310	58 939	-18.5	11.1
China	31 880	13 086	16 583	26.7	110 472	44 252	57 711	30.4	10.9
Japan	42 168	16 562	18 528	11.9	124 703	51 188	56 045	9.5	10.6
Brazil	33 852	12 744	13 058	2.5	109 207	40 591	39 081	-3.7	7.4
Netherlands	30 225	12 677	11 144	-12.1	98 637	42 549	33 206	-22.0	6.3
Canada	12 942	5 067	5 176	2.2	65 713	25 265	23 470	-7.1	4.4
Denmark	11 051	4 036	5 068	25.6	44 695	16 500	17 282	4.7	3.3
South Korea	8 390	3 980	3 510	-11.8	37 055	17 949	16 321	-9.1	3.1
Mexico	10 599	4 064	4 829	18.8	32 438	12 041	13 710	13.9	2.6
SUBTOTAL	276 609	110 751	114 540	3.4	949 298	381 076	379 764	-0.3	71.6
Other countries	136 960	51 173	45 336	-11.4	472 720	169 855	150 666	-11.3	28.4
TOTAL	413 569	161 924	159 876	-1.3	1 422 018	550 931	530 430	-3.7	100.0

Source: ODEPA and Servicio Nacional de Aduanas.

Bulk wines, registered an important decrease in the volume exported to the United States and some of the countries of the European Union. The US is the biggest importer of Chilean bulk wine, and had a significant decrease of 21% in volume exported during the first half of 2015, which will have a big impact on the total performance of the wine export for the rest of the year (Table 10).

On the other hand, a strong, positive and encouraging input came for the Chinese market, showing a very significant increase (+112%) in bulk wine imports, although not enough to offset earlier losses.

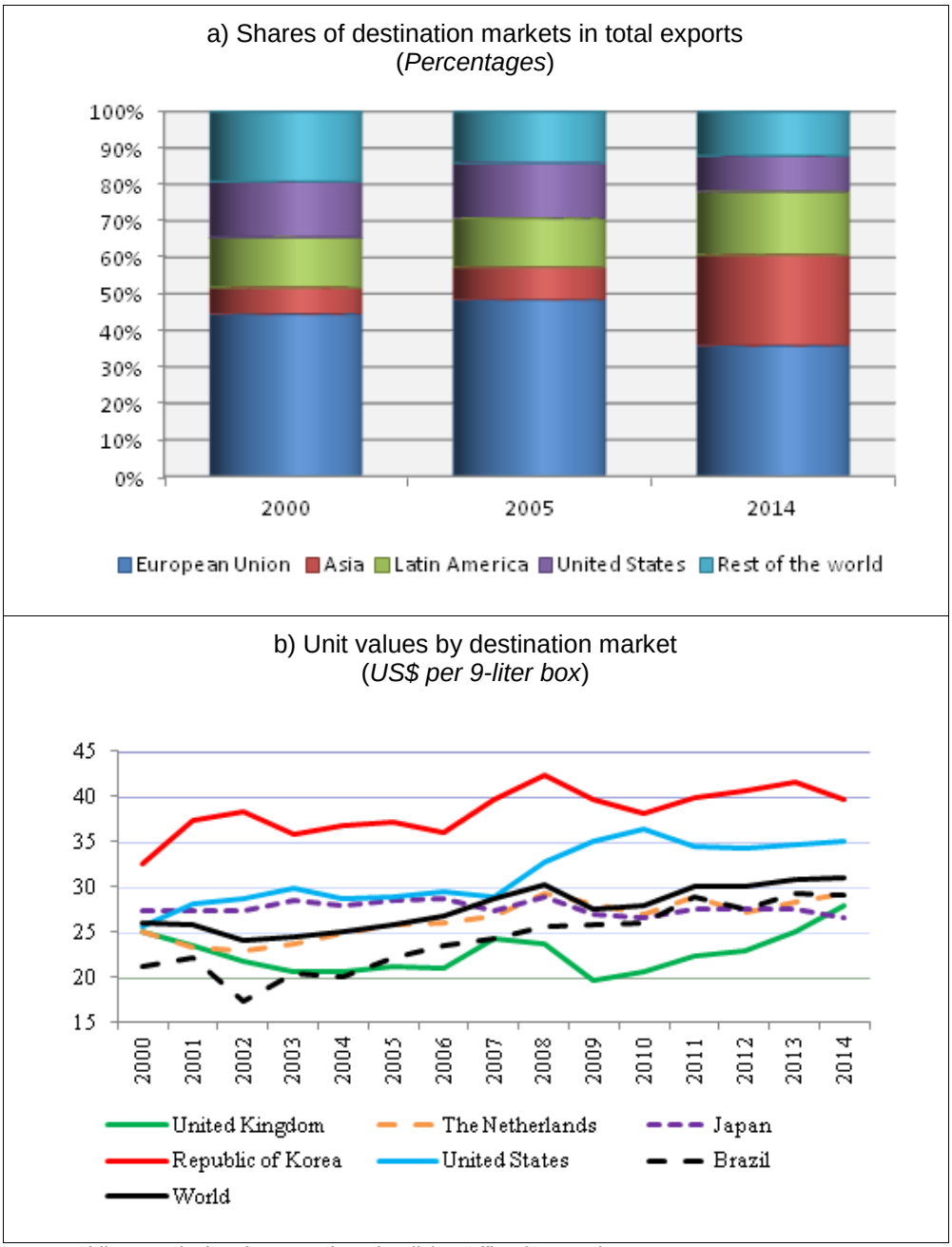
Table 11; **Bulk wine exports by country of destination**

Country	Volume (thousands of liters)				Value (thousands of USD FOB)				
	2014	Jan - May			2014	Jan - May			
		2014	2015	Δ 2015/14 (%)		2014	2015	Δ 2015/14 (%)	Share 2015 (%)
USA	85 993	54 208	42 583	-21.4%	66 836	41 934	28 286	-32.5%	22.5%
UK	46 458	18 928	18 928	0.0%	49 271	20 277	18 871	-6.9%	15.0%
China	55 142	15 053	31 913	112.0 %	35 117	9 876	17 617	78.4%	14.0%
Germany	32 761	14 231	15 372	8.0%	28 557	12 771	11 830	-7.4%	9.4%
Japan	20 840	9 888	12 566	27.1%	19 954	9 350	10 662	14.0%	8.5%
Sweden	8 030	3 637	4 256	17.0%	14 953	6 623	6 799	2.6%	5.4%
Denmark	11 838	5 358	5 133	-4.2%	14 181	6 573	5 275	-19.7%	4.2%
Canada	20 969	9 782	10 031	2.5%	13 749	6 129	5 912	-3.5%	4.7%
Finland	6 453	3 034	2 852	-6.0%	12 011	5 832	4 504	-22.8%	3.6%
Netherlands	6 777	3 006	3 192	6.2%	6 987	3 224	3 075	-4.6%	2.5%
SUBTOTAL	295 261	137 125	146 824	7.1%	261 616	122 591	112 830	-8.0%	89.9%
Other countries	34 156	14 903	13 310	-10.7%	35 143	14 875	12 632	-15.1%	10.1%
TOTAL	329 417	152 028	160 134	5.3%	296 758	137 466	125 463	-8.7%	100%

Source: ODEPA and Servicio Nacional de Aduanas.

Wine exports to Asia grew faster than those to other markets after 2000, thus its share in total exports rose substantially in 2013. In contrast, the share of the “traditional” export destinations (European Union and United States) fell during this period (Figure 22a). The unit values of wine exports differ substantially according to the destination market, which reflect different wine types and qualities exported to each market (Figure 22b). On average, Chile sells its most expensive wine to the Republic of Korea followed by the United States. All other markets pay a relatively similar price (lower) for Chilean wine. This unit value has increased over time in most countries, which is a possible indication of the better positioning of Chile in these markets.

Figure 22; **Chilean wine exports to selected destination markets: shares and unit values: 2000 to 2014**



Source: Chilean Agricultural Research and Policies Office (ODEPA)

Finally, 2015 should be seen as a transition year for Chilean wine industry; government, producers associations, and big wineries are putting their efforts to infiltrate the emerging Chinese market. Therefore, these results are not completely negative, leaving the possibility for the Chilean wine industry to playing an important role in the Asian markets in the medium-long term.

3.3 Learning capabilities and innovation

Chilean wine industry has a successful recent history. This section analyzed the factors that played an important role in the international success of the Chilean wine industry.

3.3.1 Agronomic Factors

Chile is one of the longest countries in the world 4 300 km long, but simultaneously one of the most narrow, with an average width of just 180 km. Due to its unique shape, one finds a lot of different climate conditions and soil types, which allow the cultivation of a diversified range of wine grape varieties.

The climate of Chile's Central Valley, with its cold and rainy winters, warm, frost-free springs and, hot and dry summers, is ideally suited to wine production (USDA, 2014). Furthermore, the interaction between the ocean and the Andes results in a high temperature variation between day and night, which encourages the concentration of aromatic components, especially in the grape at skins, which in turn helps to obtain very high quality and intensely colored grapes.

Wine production in Chile benefits from the country's natural isolation; its western border is the Pacific Ocean, and, to the east, it is protected by the Andean mountain range. This gives Chilean winemaking excellent phytosanitary conditions, avoiding the presence of some pests and disease. For example, Chile is one of the few wine producing countries in the world free of phylloxera. (Manuel Agosin and Claudio Bravo-Ortega, 2009; Farinelli, 2012) .

These unique characteristics offer several practical advantages, from extending the average duration of the plant production cycle (to 100-150 years), to reducing the cost of spraying treatments down to a minimum (CONICYT, 2010). Furthermore, it allows international commentators to claim that the Chilean wine made from the classic French grape varieties tastes "more authentically French than its modern French counterparts" (Arkell, 1999; Duijker, 1999; Farinelli 2012).

The Influence of the Pacific currents has a big impact on Chile's climate. It is highly influenced by the cooling effect of the Humboldt Current that begins in the icy waters near Antarctica and flows up the western coast of South America. Touching the Central Valley, it produces a fresh breeze that helps to maintain the air's relatively low humidity all

year long and ensures minimal incidence of botrytis into the vineyards (USDA, GAIN Report, 2014).

Soils in the center of Chile are healthy, well-drained, and have a variety of origins, depending on whether the plot of land is on the valley floor, at the foot of the mountains or further up the hillsides. In the plains, the soils are either lacustrine with a clay-loam texture, or alluvial with a silty loam texture. At the base of the mountains, the colluvial soils were formed from materials transported from the higher regions by water and gravity. These soils are a moderately deep loam to clay loam, with a 2 to 5 percent slope. On the steeper hillsides, the moderately deep soils are granitic in origin. The gradient, ranging from 8 to 45 percent, provides excellent drainage (Universidad de Chile, 1994).

Another essential factor in high-quality wine producing is the water management into the vineyards. Despite the relatively dry atmospheric conditions, abundant water for irrigation flows from the eternal ice caps of the Andes Mountains that tower all along Chile's eastern border. Moreover, during the last 15 years, the government has subsidized water supply and irrigation projects in the wine regions of Chile. Today, the 75% of the wineries have implemented drip irrigation systems in their vineyards (Ministerio de Obras Publicas, 2012).

Chile's unique combination of geography, climate and other agronomic factors explained above, make organic wines a suitable and profitable choice in Chilean winegrowing. In fact, Chile has some of the largest organic vineyards in the world. (Wines of Chile, 2010).

3.3.2 Process innovations

Technological change is a key factor for the industry's growth; in order to produce high-quality wines increasingly demanded by the consumers. During the last 30 years, the Chilean wine industry implemented several technical innovations to reach the quality needed to compete in the international markets. Most of the technological changes of the modern Chilean wine industry came from foreign R&Ds, brought to Chile thanks to "visionary winemakers" or foreigner investors (Farinelli, 2012; Agosin and Bravo-Ortega, 2009; Benavente, 2004).

In 1981, Miguel Torres, a Spanish winemaker and pioneer in the industry, was the father of the first technological revolution in the Chilean

wine industry. He was the first to introduce the use of stainless steel vats in place of wooden vats in Chile. The introduction of stainless steel vats allowed producers to bring the quality and taste of Chilean wines up to international standards. The stainless vats have some important properties that increase the sanitation of the winemaking process, allowing Chilean wine to meet the international standard in terms of beverage safety. Furthermore, in contrast to concrete tanks and large wood barrels, the stainless steel vats do not retain wine residues that can affect the taste and smell of the wines in the following season. He also introduced the use of small (220-liter) oak barrels, already in use nearly everywhere else, to replace the old 4,000-liter casks in which all Chilean red wines were kept.

Finally, steel vats allow the producer to control the temperature of the wine during the process of fermentation, which is fundamental in high-quality wine production (Agosin and Bravo-Ortega, 2009).

Alongside the first technical revolution, another small group of Chilean oenologists, such as Alejandro Hernandez, Pablo Morandé, and Aurelio Montes played an active role in promoting the Chilean wine industry. Pablo Morandé was chief winemaker for Concha y Toro (the biggest winery in Latin America) and then started his own business (Viña Morandé) in the Casablanca Valley, establishing the first winery of what became one of the most prestigious wine valleys of Chile.

Aurelio Montes, owner of Viñas Montes, was one of the most important oenologists and businessmen that helped the Chilean wine industry to export in the US market at the beginning of the 1990s (from Francisca Fresno's interview, FIA).

After the stainless steel revolution introduced by Torres, there was another important change in the industry: the emergence of the production line in the second half of the 1980s. Before the introduction of the production line, bottling and corking were not standardized; in spite of the fact that all bottles contained three-quarters of a liter, bottles were reutilized and had different shapes (Farinelli, 2012; Agosin and Bravo-Ortega 2009). This change was mainly carried on through business associations (ChileVid and AVC), bottle characteristics were made uniform, bottle reusing was eliminated and the modern production line became the industry norm.

Among the most important technological changes introduced into the Chilean industry in the last 30 years, it should be mentioned also the installation of refrigeration devices both for fermentation and maturation, and the use of pneumatic presses rather than old vertical ones introduced in the beginning of the 1990s.

According with Farinelli (2012), the second technological revolution started in the mid-1990s. It was driven by seasonal foreign consultants, as well as by young Chilean oenologists and agronomists. It consisted of a diffusion of tacit knowledge in viticulture, made necessary by modern cultivation techniques. The aim was to highlight the distinctive character of Chilean wines, including that of its typical variety, Carmenère.

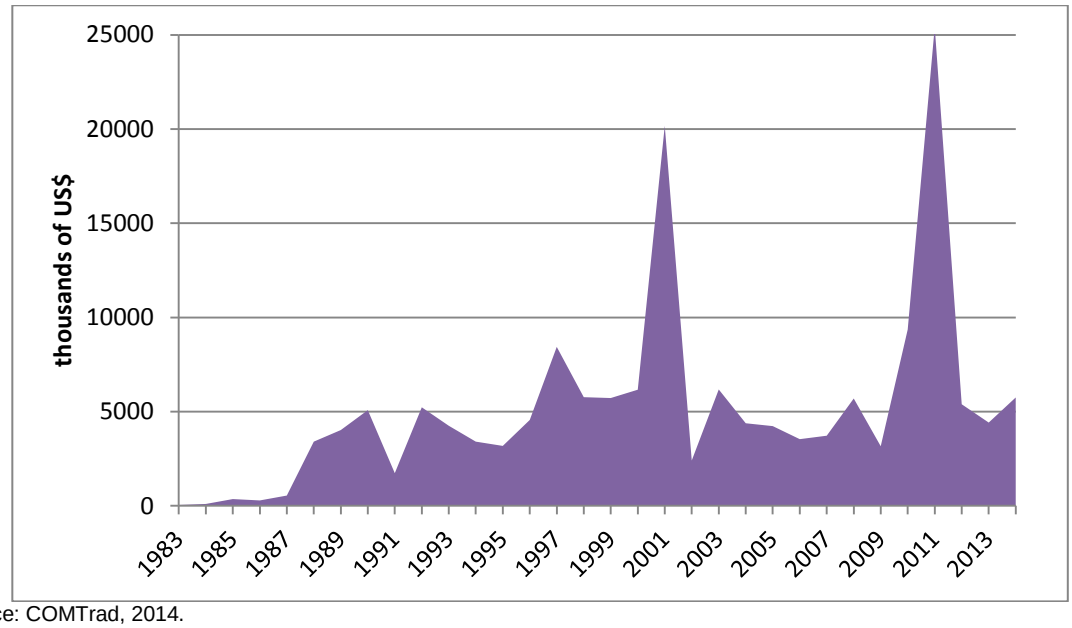
The first stage, “learning by looking,” consisted of foreign travel at harvest time by Chilean oenologists and viticulturists to the international centers of winemaking, mainly in France and in the United States. In fact, today it is common for a young oenologist make his first vintage in Chile after having participated in a few abroad. The second stage was the participation of foreign oenologists in the Chilean harvest season. In this manner, a direct exchange of experiences was produced between the main actors in wine production (Agosin and Bravo-Ortega, 2009).

This new generation of young, highly qualified oenologists, with extensive experience abroad and well reputed university degrees, has rapidly taken over technical and commercial tasks, as well as full decision-making responsibilities in both foreign and nationally owned wineries.

Currently, the 2014 US Foreign Agricultural Service report has estimated that in the Chilean wine industry, over 46 percent of wine storage containers at wineries are stainless steel tanks, while 39 percent of the wineries use oak barrels made from French or American wood, for an average of 3-5 years, which shows a good technological development standard for the whole industry (USDA, GAIN Report, 2014).

According to ComTrade data, during the last three decades Chile has been a big importer of machinery and equipment for winemaking, mainly from Europe and the USA (figure 23)

Figure 23; **Imports of machinery used in the manufactured of wine**



Source: COMTrad, 2014.

This has led to a deep technological conversion process, and an overall upgrading of the local wine industry, with several wineries being transformed into state-of-the-art wineries, equipped with the most advanced machineries and technologies. From 1988 to 2014, Chile undertook an investment in foreign winemaking machinery of more than 164 million US$, and in 2001 and 2011 the country represented the largest importer of winemaking equipment in the world. (Farinelli, 2012 & COMTrade).

3.3.3 Institutional setting & public sector

The National Innovation System in Chile is integrated by public entities aiming at the creation of policies and the support to innovation, by means of various financing funds, and by a group of public and private entities focused on research, technological development, transfer and innovation. This group is integrated by companies, universities, technological institutes and research centers.

Chile allocates 0.68% of its Gross Domestic Product to research and development, which ranks it second in Latin America, preceded only by Brazil, but among the last in the OECD countries (OECD average is 2.5% of the GDP) (OECD, Factbook 2014, 2013). A 53% of the investment

in R&D is made by the public sector, 37% by the private sector and 10% by other sources. 46% of these resources are used in R&D activities developed by companies, 32% by universities, 10% by public bodies and 12% by private nonprofit institutions (CONICYT, Analytical report, 2010).

Chile has various public funds to support the R&D. These are contestable funds where resources are allocated based on excellence criteria as a strong response to demand and contribution to mobilize the private sector resources (CONICYT, 2007). In this context, the Chilean Economic Development Agency (CORFO) and the National Commission for Scientific and Technological Research (CONICYT) are essential for the system. CORFO's innovation component is focused on technology innovation for companies, technology transfer and dissemination, pre-competitive and public-oriented innovation. CONICYT aims to promote and strength scientific and technological research, the development of specialized human resources and new areas of knowledge and productive innovation.

Among others, CORFO has promoted the study of the Chilean viticultural potential, the modernization of the existing small winemaking cooperatives, the creation of sectoral wine associations, as well as financial and technical assistance to wineries needing technological upgrading.

One of the projects being undertaken in the sector has to do with the development of a technology program and network of cooperation for the training of future Wine Cluster in central Chile in the Maipo Valley (Moguillansky et al., 2006). The aim of the initiative is to develop and consolidate the wine industry in the metropolitan area as part of an overall strategy to improve the competitiveness of Chilean wines.

In the agricultural sector, three public agencies affiliated to the Ministry of Agriculture also have contributed significantly to the sustainability agenda of the wine industry. The Chilean Agricultural Research and Policies Office (ODEPA) is the secretariat of National Winemaking Commission, created in 2002. This Commission incorporates all public and private players of the wine value chain and formulates and implements short, medium and long term strategies related to the sector's competitiveness. Its main purpose is the reduction of gaps between small and large producers in terms of marketing, certification and sustainability (Gálvez-Nogales, 2010). Nowadays, the main goal is increase the exports of small producers (Farinelli, 2012).

The other agency is the Agricultural Research Foundation (FIA). This foundation aims to promote the innovation of small businesses in the

agriculture and food sector, with the aim of contributing to the environmentally sustainable and inclusive development of rural areas.

Finally, Instituto de Investigaciones Agropecuarias (INIA) is in charge to foster and to promote the scientific research in agriculture in partnership with the most valuable universities of Chile. With its ten research stations located from north to south, aimed to generate and shares scientific knowledge and technologies to increase the industry's innovation[10]. The experimental center of Cauquenes is the most focused on viticulture, with more than hundred scientific publications since 1970 (E. Sanhueza, 2010).

Financing of these bodies derived from public resources and programs funded by credits from international entities, such as the World Bank and the Interamerican Development Bank, or by foundations and bodies such as the European Union.

Furthermore, during the last decade two new technological and R&D consortia have been created, both with government support: Vinnova in 2004 and TecnoVid in 2006. Both consortia represent a very important step towards institutional renewal, and respond to the urgent need for increased collaboration between the industry associations, the main research institutions and the universities (Morrison and Rabellotti, 2014).

Both technological entities are dependent on Wines of Chile and work together with wineries, universities and research centers in order to explore and develop production methods that are more environmentally friendly and result in improved viticultural and oenological practices.

To encourage the development and the coordination of the above organizations the government has established Pro-Chile, which is a government agency under the Ministry of Foreign Affairs, designed to promote Chilean exports and making national competitive programs for export promotion.

3.3.4 Education and skills

Universities in Chile mainly train winemakers, many of whom are agricultural engineers with a specialization in oenology. The predominant universities in this area are the Catholic University, University of Chile, University of Concepción and University of Talca.

[10] In 2015, INIA is supervising a project aimed to produce the first "zero-alcohol" wines of Chile (one from Pais variety with 0.5% and another one from Cabernet Souvignon variety with 6% of alcohol).

The University of Chile, with its Group of Ecological Research (GIE) and the Department of Agribusiness and Enology (Faculty of Agronomic Sciences), supports the industry through specific research projects and providing a range of business services, such as analysis of wines, spirits, sensory analysis, microbiological analysis, soil analysis, plant disease and others.

For its part, the Catholic University with the Wine Centre (CEVIUC), provides research and in turn develops projects together with producer associations.

The University of Talca with its Technology Center of Vine and Wine (CTVV) created in October 1996 by the University of Talca, due to support from FONDEF (a fund for scientific research offered by CONICYT) and the private sector through the association of producers of fine wines export (Chile Vid and AVC) is a specialized unit to contribute to the development of national export wine industry. The contribution to the industry can be summarized as follows; they perform applied research in viticulture and enology, offer technology services to industry and ongoing training programs.

3.3.5 Marketing and publicity

It is clear for the future of the industry that the wine-country image is fundamental to success on the international market. For this reason, aside Pro-Chile (a government agency), two business associations were created in the beginning of the 1990s: Asociación de Viñas de Chile (AVC) and ChileVid. They have been extremely important in climbing up the quality ladder and promoting the image of the Chilean wine industry inside and outside the country. ChileVid brings together 42 wine producers, while AVC counted 52 members. These two associations represent the 90 per cent of the Chilean wine producers. They have been involved in relaying to producers key information about the requirements of foreign markets (quality, labeling, types of bottles required, cork specification, and the move toward bottles that are used only once) and organizing the attendance of producers at major wine fairs in the world (trips that have been partially subsidized by CORFO programs) (Agosin and Bravo-Ortega, 2009). Furthermore, the quality of marketing (labeling, branding, the art-work on the label, names and blurbs used, etc) of individual producers is continuously evaluated and improved.

Recently, both associations decided to join the force to promote the image of Chilean wines abroad with the creation of Wines of Chile in 2007.

This private non-profit association, with its offices in London and Santiago, is in charge of marketing the concept of Chilean wine through fairs and other activities, and providing information on foreign markets.

Recently, Wines of Chile has focused on several sustainability projects and international marketing campaigns, which aim to transform Chile into the world's leading producer of sustainable premium wine in the "New World" by 2020 (Berry, Mulder and Olmos, 2015; Wines of Chile, 2012).

Alongside the important efforts to promote the country around the world, ChileVid and AVC also have cooperated with FIA in important projects to attract wine enthusiasts and agro-tourists in Chile. The most important one was the establishment of routes of wine (rutas del vino) in the Central Valley. Actually, there are three routes of wine: Colchagua Valley, Casablanca Valley and Isla de Maipo that attract thousands of tourists every year.

According to Francisca Fresno of FIA, those routes of wine are a big opportunity not only for the tourism sector, but also to push the wine producers investing in their own wineries, adding other services such as restaurants and bed & breakfast, in order to diversify the business and increase the attraction for the whole industry.

However, Francisca Fresno highlighted some issues that are slowing down the establishment of new routes of wine. The main one is related to the heterogeneity of the Chilean winery landscape. In fact, along the same route of wine, it is fundamental have the same standard of quality in terms of facilities, accommodations and restaurants. This can be easily implemented in big wineries that have the capitals needed to invest in their own infrastructures, but it is more difficult for small wineries that have limited resources. These critical issues can be overcome only with the help of subsidized policies designed specifically for small wine producers by the government.

3.4 Future and challenges

The future of the Chilean wine industry passes through different projects and challenges to establish Chile as the first wine producer of the New World. In this section, it is presented the last challenges that the Chilean wine industry has to face in the near future.

Sustainability

Over the past decade there has been growing pressure around the globe to improve the environmental sustainability of the wine sector. The pressure arose in part from the wine sector itself because it is suffering from the effects of climate change, but also from consumers who prefer to drink wine that has been produced in a sustainable and green manner.

Climate change influences both the baseline climate and its variability, and as a result, it can “produce changes in the personality of regional wines” (PricewaterhouseCoopers, 2009).

In Chile, most of the greening process is driven largely by external specialized public and private service providers that offer hi-tech solutions and technologies. Today, one of the major concerns of Chilean wine industry relates to the management of liquid wastes and the assessment of the carbon footprint of the wineries. Furthermore, it fosters organic cultivation of grapevines (thank to the incredible phytosanitary conditions of Chile), energy and water efficiency and the development of sustainability reports.

Many companies are already working hard to transform Chile into the number one producer of sustainable and diverse premium wines from the New World by 2020 (Wines of Chile, strategic plan 2020, 2012).

Searching for new terroirs

According to Purdy (2000) and Farinelli (2012), even though the “classic” French varieties are the most successful at the international level, and an emblematic variety (Carmenère) has been clearly identified, Chile has not yet developed a local style which is strong enough for international consumers to distinguish Chilean wines with enough clarity and originality.

Recently, significant efforts have been made in order to explore new terroirs, especially in cooler places where vines can be grown to produce wines that are naturally lower in alcohol content. This means examining the soils in depth as well as carefully evaluates the microclimatic conditions. But, this also includes the search for new clones that will adapt well to new climate and soil conditions, allowing Chile to deliver wines with an authentic expression of their origin to the world (Berry, Mulder and Olmos, 2015).

Private/public partnerships

The increasing international competition into the wine market, is forcing Chile to re-think its articulated and complicated system of

governmental and private bodies related to the wine industry. According to Francisca Fresno of FIA, the government has recently put all its efforts to establish a solid partnership between Pro-Chile, the government agency in charge to promote wine exports, and Wines of Chile, the private producer association; with the aim to increase the positioning of Chilean wines on the international markets, with a specific focus on Asia.

Breaking the old paradigm

Over time, Chile has developed the reputation of an exporter of low-priced, good quality, extremely fruity and "clean" varietal wines (Farinelli, 2012). This "paradigm" regarding Chilean wines has led to an inferior price compared to other competitors (e.g Australia), for the same quality product. According to the many authors (Farinelli 2012, Agosin-Ortega 2009; Wines of Chile, 2012) this is not a matter of the intrinsic quality of Chilean wines, but more about the consumer's perceived quality. Therefore, to break this paradigm, private producer associations and public bodies are working together to enhance the country imagine, improve the commercialization and the market intelligence of the Chilean wine industry, with the aim to reach higher price segment into the market.

Entering into emerging markets

The biggest challenge for the entire industry is to break through the Asian markets avoiding the errors committed in the past.

The focus is on Korea, Japan, Hong Kong, and especially China (Shanghai and Beijing), with the establishment of regional headquarters for each country. The actions are focused on each market, due to the large differences between them (culture, growth curves, and levels of penetration of wine category). The aim is to avoid being trapped in the niche of good quality cheap wines but rather to target higher prices from the beginning.

In the specific case of the Chinese market, the industry is pursuing two different strategies; selling high-priced premium and super-premium wines in selected regions with high concentration of middle/high class consumers that can afford the purchase of luxury products. While, exporting bulk wine that will be bottled directly in China to reach low-income consumers.

Conclusions

The structural reforms implemented in Chile after the *Coup d'état* contributed to stable economic growth during the last twenty-five years. Since the mid-1970s, the country has succeeded in the process of transforming itself in an export-led economy with high level of trade openness.

The whole economy took advantage of this change. In particular, agriculture benefited from the trade liberalization, exported led growth strategy and the insertion of its products in the international market, succeeding the export's diversification process.

In this context, the new economic paradigm permitted the country to open its frontiers to international investors, with the creation of joint-ventures and new local entrepreneurships that contributed substantially to the development of natural resources industries with massive investments.

One of the segments that benefited more from this context was, without doubts, the wine industry; the foreign investments during the 1990s, in terms of know-how and technologies, were key drivers in the industry's catching-up process and allowed Chile to become one of the best wine producer countries of the New World. Despite the fact that the Chilean wine industry is relatively recent compared with other European countries, wine was one of the most important commodity in terms of exports value and was an international success for Chile.

Furthermore, the Government surely played an important role in this success with specific development strategies through semi-public bodies to promote research and development and state-sponsored accumulation of production factors indispensable for the development of the wine industry.

However, the catching-up process of the wine industry cannot be fully understood without the analysis of the interactions among the macro setting (GDP and sectoral composition, variation in productivity and employment generation), the description of the international competiveness framework (gains and losses in market share and specialization index) and the endogenous sources of innovation of the wine industry (natural comparative advantages, innovation of processes, role of universities and public institutions). Therefore, to

deeply understand this process and its evolution, it was necessary to study the country's macroeconomic context of the last 50 years.

The first chapter disclosed that Chile is not an agricultural-based economy nowadays. However, agricultural sector played an important role regarding many aspects of the Chilean economy. showed

First, it has been shown that agriculture was an important source of employment during the period before the new economic paradigm (1950-1970). With the development of new economic sectors, however, the employment in agriculture showed a steady decline during the last thirty years, to the point in which it now occupies only 10% of the overall employment, as much as the manufacturing sector.

Second, the productivity of the agricultural sector increased constantly during the last fifty years, recording the highest growth rate compared to the other sectors in the time of this analysis.

Third, due to the high number of bilateral trade agreements stipulated, agricultural exports increased considerably in the last two decades, actively contributing to the trade balance of Chile. Furthermore, Chile succeeds penetrating the Chinese market with its agricultural products, paving the way to further important development in terms of market insertion of new products and risk management strategy.

Thus, the agricultural sector evolved following the growth path of the whole economy and increasing its productivity by the time. This pattern has been sustained by new investments within the sector and by an export expansion process. That is, the growth process and the market strategy evolved during the whole period of the analysis, showing an important contribution to the whole economy of Chile, in particular to the exports.

In chapter two, the results of the competitive analysis showed as the Chilean agricultural sector was overall competitive at a regional level, just behind bigger economies like Brazil and Argentina. Anyhow, further analysis highlighted that Chile was highly specialized in commodities that were losing importance in the international market, showing a weak international competitiveness during the period between 1989 and 2005. This period was characterized by high polarization of agricultural products in undesirable categories (mainly declining stars and retreats) of the competitiveness matrix.

Things changed in recent years, when the Chilean government started a new development strategy to promote sectoral specialization in dynamic agricultural products, increasing the international competitiveness of the agricultural sector in the period between 2005 and 2013, showing a good and more balanced redistribution of agricultural products within the matrix's categories: with 27.1% of products belonging in the rising stars group, 21.8% to declining stars, 33.6% were missed opportunities and 24.4% were retreats. In this period, products such as natural honey, berries, milk and fresh fruits (table grapes in particular) were drivers of this positive change.

A special consideration should be given for wine. According to the analysis, wine played an important role in terms of competitiveness and market share between 1989 and 2005, belonging to the rising stars category during this period. Unfortunately, in the period between 2005 and 2013, Chilean wine shifted into the declining stars category. However, the fundamental contribution that this commodity played during the first period of the new economic context of Chile (1990s) should be highlighted, in terms of value and market insertion.

Table 12; **A taxonomy of endogenous competitive sources of the Chilean wine industry**

Agronomic factors	• Suitable climates • Excellent phytosanitary conditions • Good soils • Advanced watering systems
Process innovation	• Use of stainless steel vats • Use of pneumatic presses • Bottling and corking standardization • Refrigeration devices in fermentation and maturation processes
Institutional settings	• Chilean Economic Development Agency (CORFO) • National Commission for Scientific and Technological Research (CONYCIT) • The Chilean Agricultural Research and Policies Office (ODEPA) • Agricultural Research Foundation (FIA) • Instituto de Investigaciones Agropecuarias (INIA)
Universities	• Università Catolica – Wine Center (CEVIUC) • Università de Chile • Università de Talca – Technology Center of Vine and Wine (CTVV) • Universita de Concepcion
Marketing	• Wines of Chile – producers association in charge to promote Chilean wines abroad

As suggested in chapter three and resumed in Table 12, the success of the wine industry in the case of Chile has been addressed according to its unique agronomic factors (variability of climates and soils suitable for grape vine growing, unique phytosanitary conditions and advanced and diffused watering systems), governmental support though the institution of many semi-public bodies acted to promote technological innovation in the industry; good universities programs that every year graduate high specialized winemakers and

agronomists, and country's image promotion through Wines of Chile (a private wine producers association); allowing high market competitiveness and fast technological catching-up of the Chilean wine industry.

However, the results highlighted how much Chile is dependent on foreign technologies to develop its own industry's framework, leaving the country at the edge of the industry's pioneer group. Furthermore, the complexity of the public-private bodies involved in the industry development, resulted in waste of precious resources due to low coordination within the agencies.

Finally, the future of the Chilean wine industry should pass through different challenges that include different level of operation. On the one hand, the industry is trying to positioning itself in the Asian markets directly in the premium wines segment. In the meantime, it is also climbing the price ladder in the consolidated markets (mainly UK and USA) breaking the old paradigm of "good and cheap" wine that characterized the whole industry. On the other hand, active governmental policies and private initiative are trying to increase the sustainability of the industry through the implementation of the most advanced technologies, while scientific research is focused on searching new *terroirs* to improve the quality of Chilean wines to offer to the international consumers.

Appendix

1. **Market share**. The value of exports of commodity i from country A to import market B as a percentage of total value of imports of commodity i on market B.
2. **Percentage of exports.** The value of exports of commodity i from country A to import market B as a percentage of total value of exports of country A to market B.
3. **Specialization.** Compares the market share of country A for commodity i to the overall market share of country A. If the commodity market share is higher than the overall market share, the country is said to be specialized in commodity i. If it is lower, the country is said to be not specialized in commodity i.
4. **Percentage of imports.** The value of imports of commodity i on import market B expressed as a percentage of total value of imports on import market B.

Formulas

M Total import value

$\mathbf{M_j}$ Value of imports originated in the Exporter Country $_j$

In TradeCAN it is supposed to be equal to the total exports from Exporter Country $_j$ to the Import Market.

$\mathbf{M_r}$ Value of imports originated in the Rival (Export) Country $_r$

$\mathbf{M_i}$ Value of imports of commodity $_i$

$\mathbf{M_{ij}}$ Value of imports of commodity $_i$ originated in Exporter Country $_j$

Market Share (**MS**) = $\mathbf{M_{ij} / M_i}$

Percentage of Exports (**PE**) = $\mathbf{M_{ij} / M_j}$

Specialization (**SP**) = $\mathbf{(M_{ij} / M_i)/(M_j / M)}$

Percentage of Imports (**PI**) = $\mathbf{M_i / M}$

Dynamic sector: $\mathbf{(M_i/M)^{\text{base year}} > (M_i/M)^{\text{final year}}}$

Stagnant sector: $\mathbf{(M_i/M)^{\text{base year}} < (M_i/M)^{\text{final year}}}$

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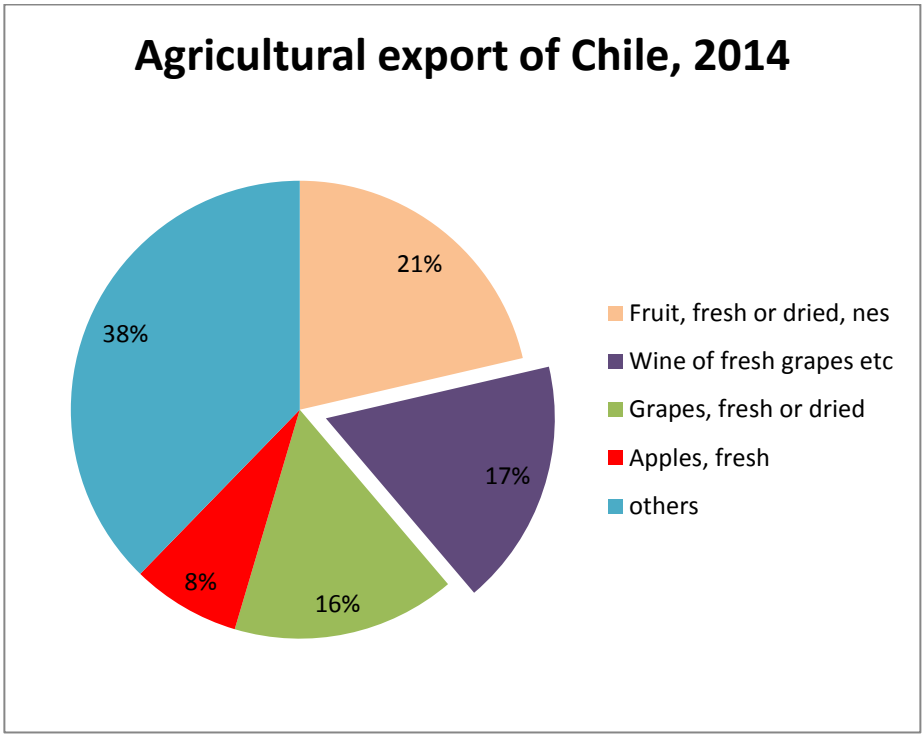
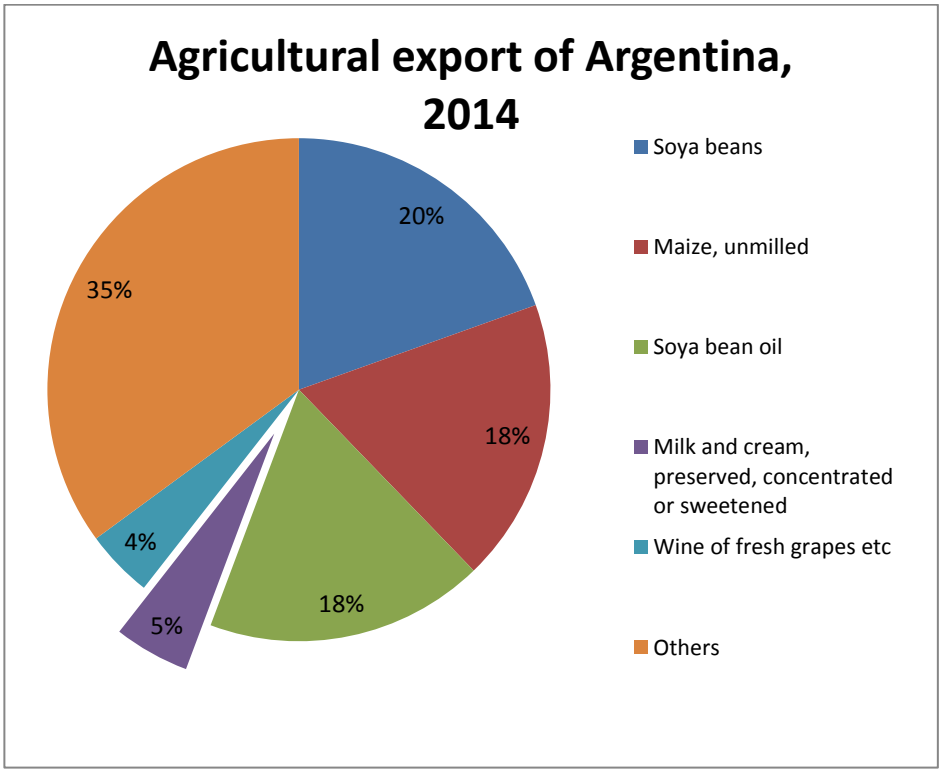
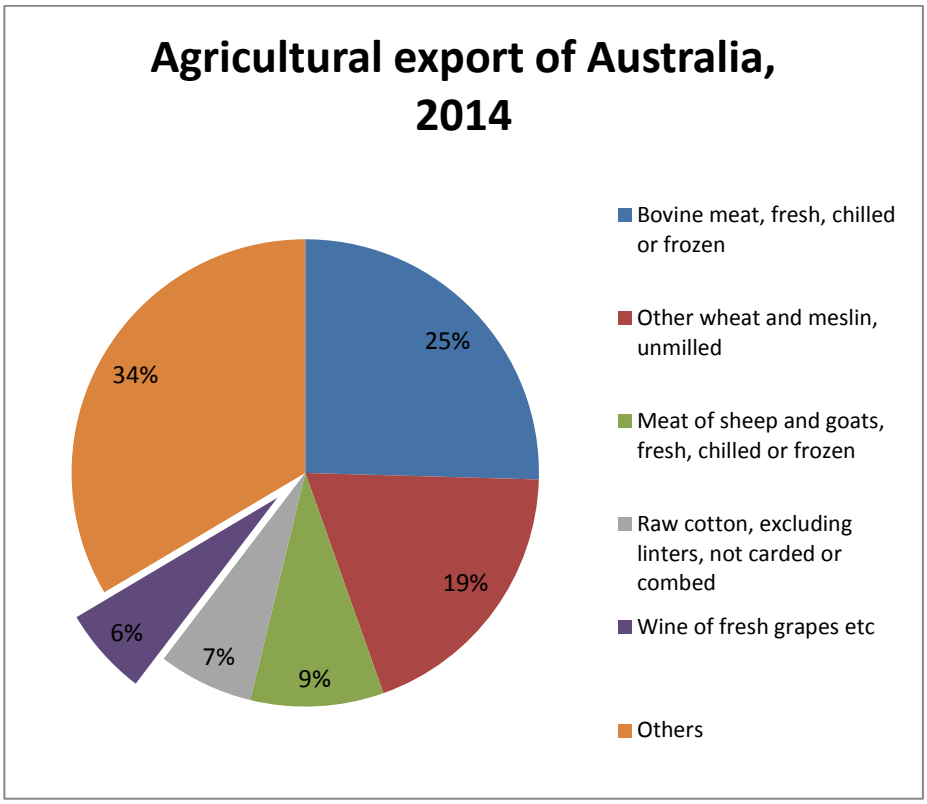
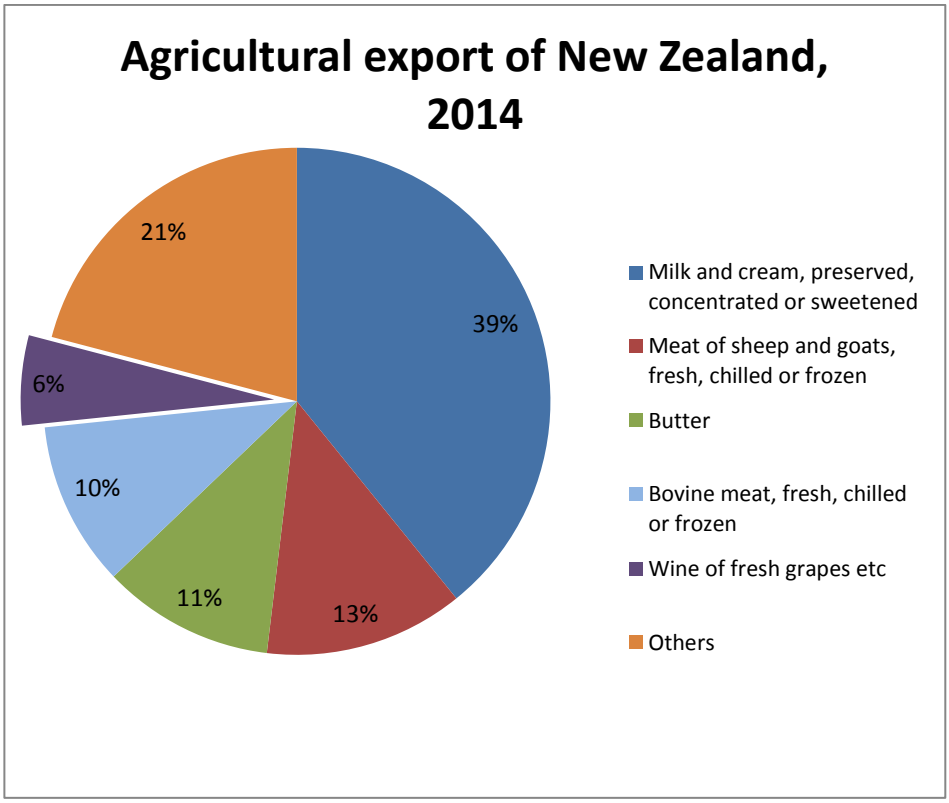
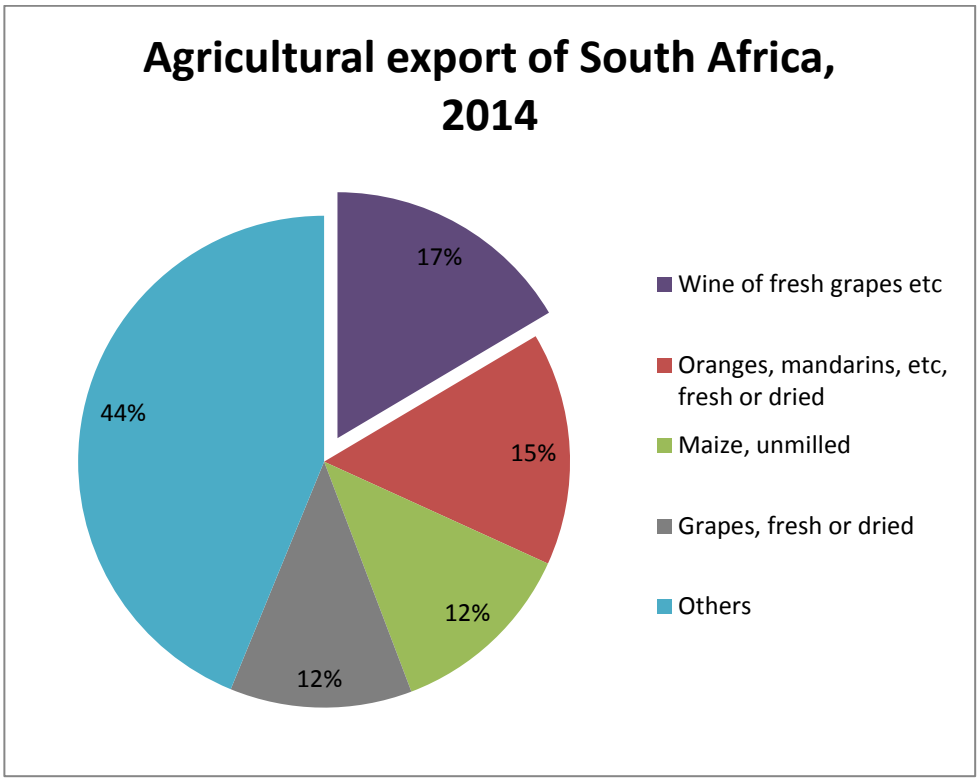
Annex 1

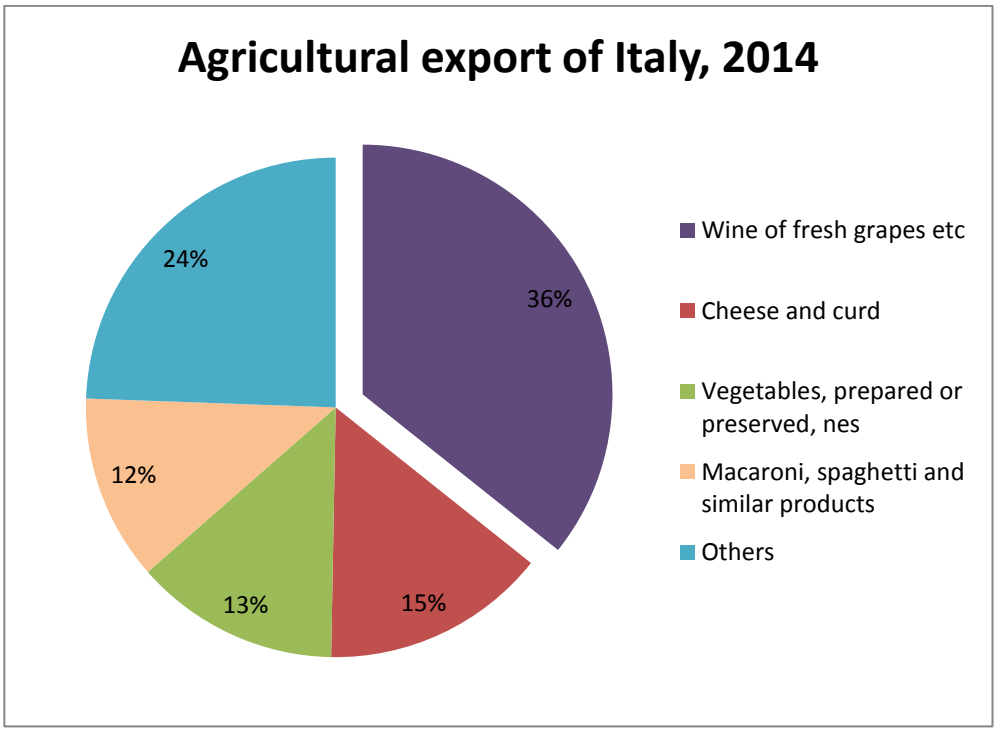

Agricultural export of Chile, 2014
21%
17%
16%
8%
38%
Fruit, fresh or dried, nes
Wine of fresh grapes etc
Grapes, fresh or dried
Apples, fresh
others

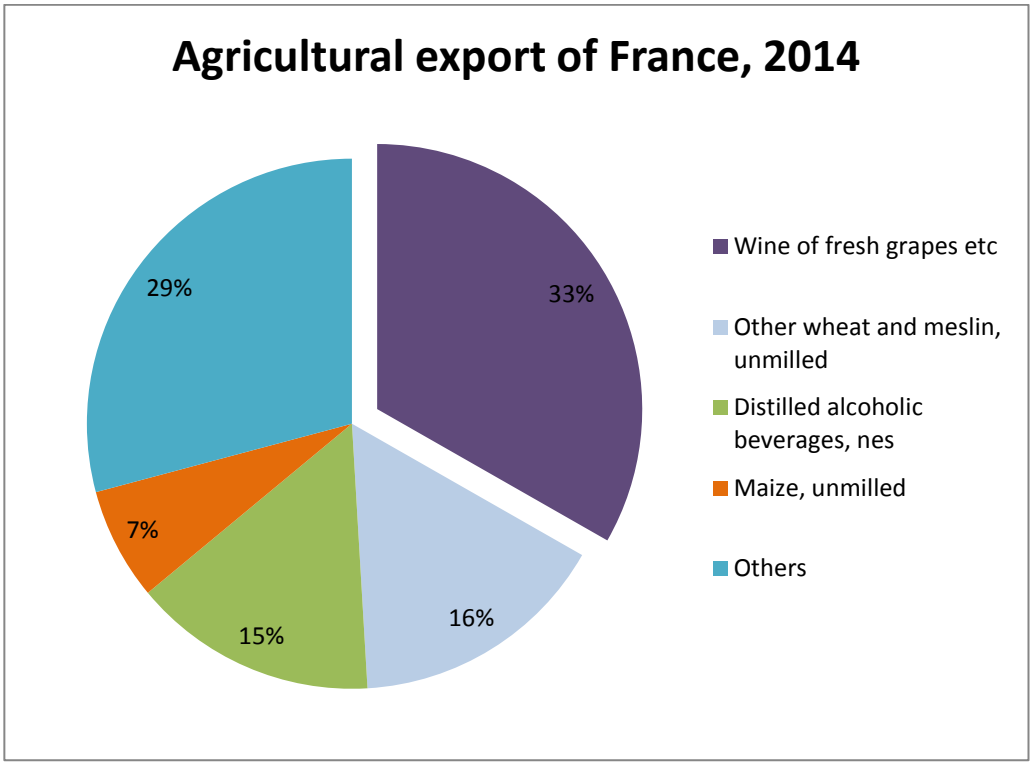

Agricultural export of Argentina, 2014
20%
18%
18%
5%
4%
35%
Soya beans
Maize, unmilled
Soya bean oil
Milk and cream, preserved, concentrated or sweetened
Wine of fresh grapes etc
Others

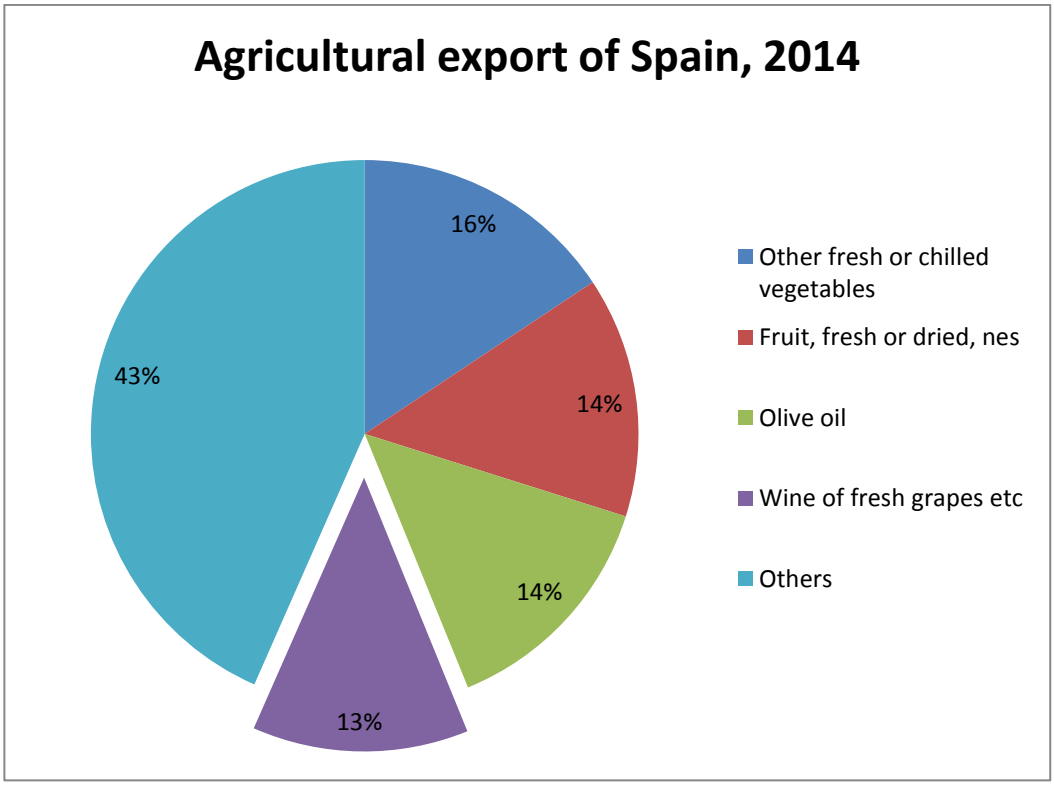

Agricultural export of Australia, 2014
25%
19%
9%
7%
6%
34%
Bovine meat, fresh, chilled or frozen
Other wheat and meslin, unmilled
Meat of sheep and goats, fresh, chilled or frozen
Raw cotton, excluding linters, not carded or combed
Wine of fresh grapes etc
Others


Agricultural export of New Zealand, 2014
39%
13%
11%
10%
6%
21%
Milk and cream, preserved, concentrated or sweetened
Meat of sheep and goats, fresh, chilled or frozen
Butter
Bovine meat, fresh, chilled or frozen
Wine of fresh grapes etc
Others


Agricultural export of South Africa, 2014
17%
15%
12%
12%
44%
Wine of fresh grapes etc
Oranges, mandarins, etc, fresh or dried
Maize, unmilled
Grapes, fresh or dried
Others


Agricultural export of Italy, 2014
36%
15%
13%
12%
24%
Wine of fresh grapes etc
Cheese and curd
Vegetables, prepared or preserved, nes
Macaroni, spaghetti and similar products
Others


Agricultural export of France, 2014
33%
16%
15%
7%
29%
Wine of fresh grapes etc
Other wheat and meslin, unmilled
Distilled alcoholic beverages, nes
Maize, unmilled
Others


Agricultural export of Spain, 2014
16%
14%
14%
13%
43%
Other fresh or chilled vegetables
Fruit, fresh or dried, nes
Olive oil
Wine of fresh grapes etc
Others

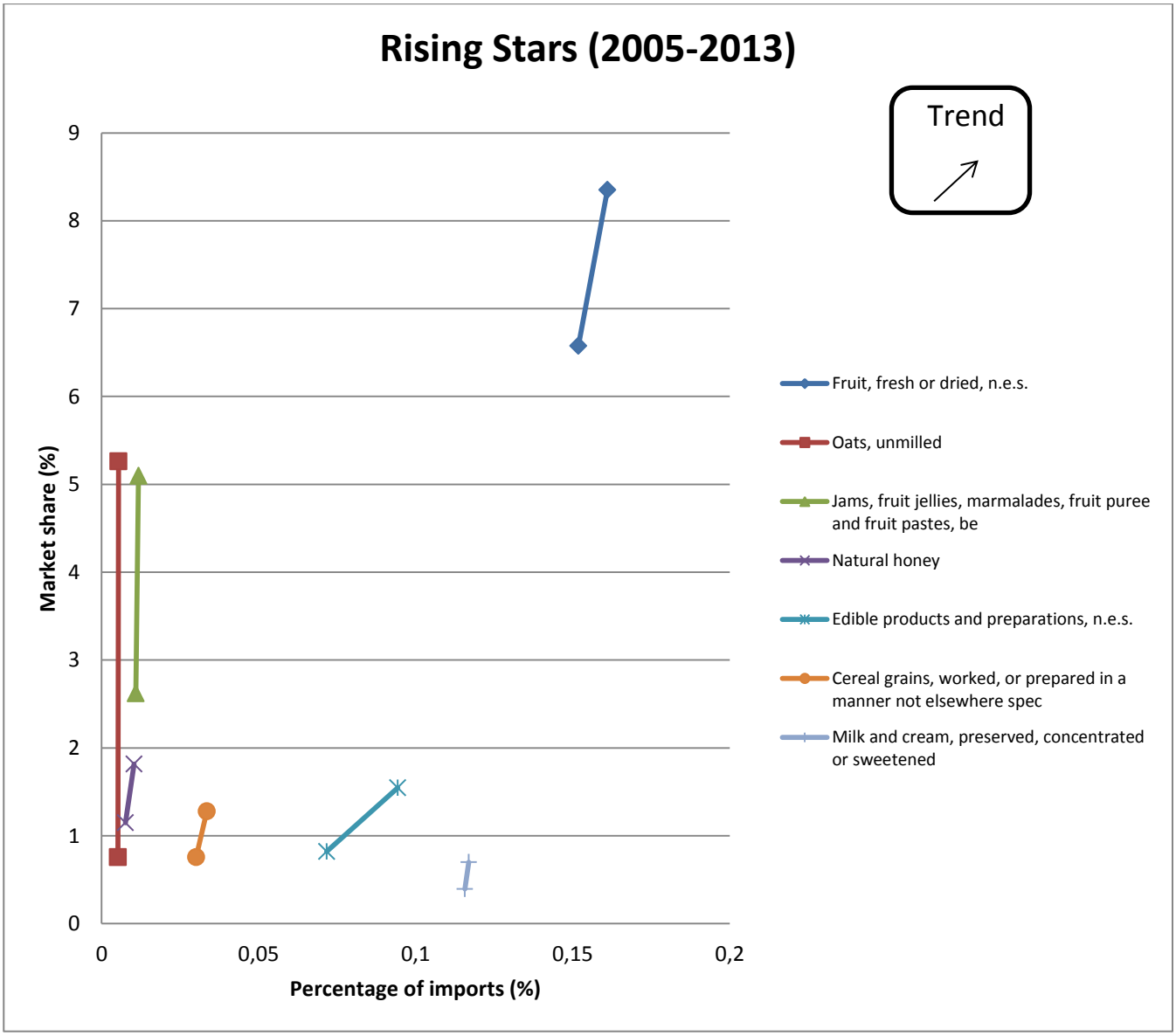
Annex 2

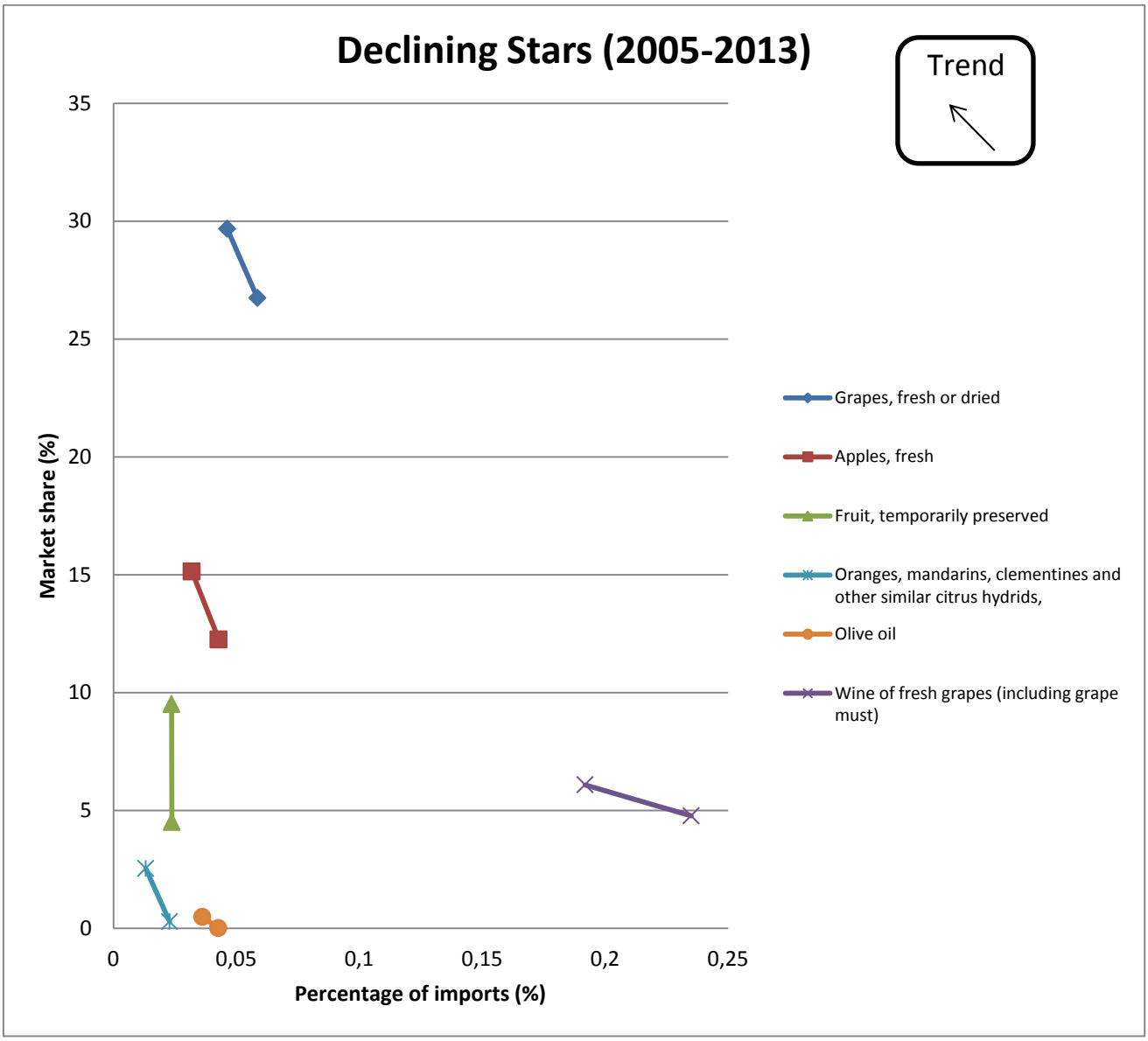
Commodity Code	Commodity Name
142	Sausages and the like, of meat, meat offal or animal blood
223	Milk and cream, fresh (including skimmed milk, buttermilk, sour m
481	Cereal grains, worked, or prepared in a manner not elsewhere spec
484	Bakery products (e.g., bread, biscuits, cakes) and other baked go
488	Malt extract; preparations of flour, meal,starch or malt extract,
544	Tomatoes, fresh or chilled
565	Vegetables, prepared or preserved, n.e.s.
577	Edible nuts (excluding nuts chiefly used for the extracting of oi
616	Natural honey
620	Sugar confectionery (except chocolate confectionery) and other su
914	Margarine, imitation lard and other prepared edible fats, n.e.s.
980	Edible products and preparations, n.e.s.
1110	Non-alcoholic beverages, n.e.s.
1121	**Wine of fresh grapes (including grape must)**
1122	Other fermented beverages, n.e.s. (e.g., cider, perry and mead)
1123	Beer made from malt (including ale, stout and porter)
1221	Cigars and cheroots; cigarillos
2929	Other materials of vegetable origin, n.e.s.
4232	Soya bean oil
4235	Olive oil
4236	Sunflower seed oil
4311	Oils, animal and vegetable, boiled, oxidized, dehydrated, sulphur
12	Sheep and goats, live
13	Swine, live
14	Poultry, live (I.e., fowls, ducks, geese, turkeys and ginea fowls
15	Horses, asses, mules and hinnies, live
111	Meat of bovine animals, fresh, chilled or frozen
112	Meat of sheep and goats, fresh, chilled or frozen
113	Meat of swine, fresh, chilled or frozen
116	Edible offals of the animals falling in headings 001.1, 001.2, 00
118	Other fresh, chilled or frozen meat or edible meat offals
121	Bacon, ham and other dried, salted or smoked meat of domestic swi
129	Meat and edible meat offals, n.e.s., salted, in brine, dried or s
149	Other prepared or preserved meat or meat offals
224	Milk and cream, preserved, concentrated or sweetened

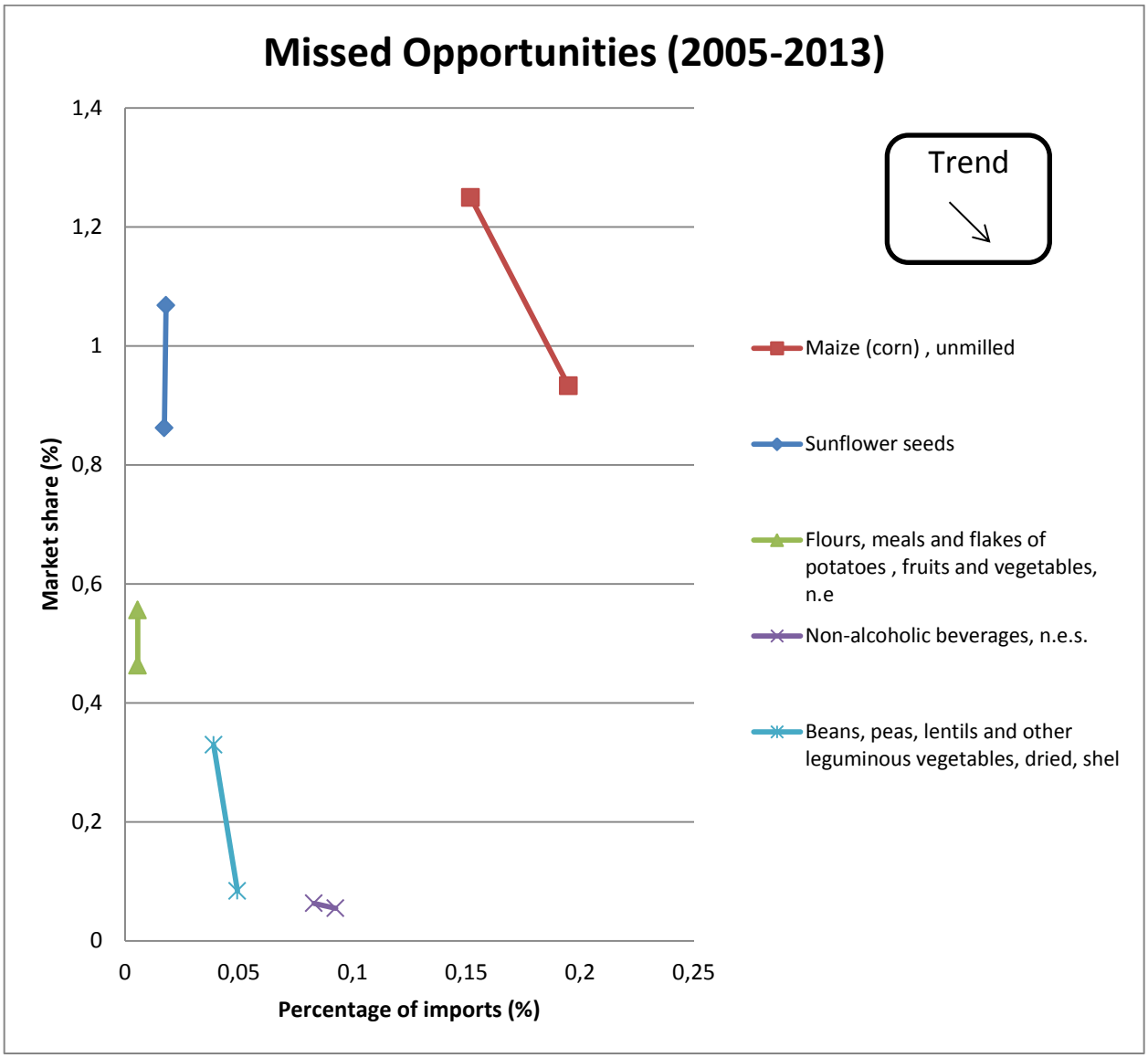
230	Butter
240	Cheese and curd
251	in shell
341	Fish, fresh (live or dead), or chilled (excluding fillets)
342	Fish, frozen (excluding fillets)
343	Fish fillets, fresh or chilled
344	Fish fillets, frozen
350	Fish, dried, salted or in brine; smoked fish (Whether or not cook
360	Crustaceans and molluscs, whether in shell or not, fresh, (live o
430	Barley, unmilled
440	Maize (corn) , unmilled
470	Other cereal meals and flours
483	Macaroni, spaghetti and similar products
541	Potatoes, fresh or chilled (not including sweet potatoes)
548	Vegetables products, roots and tubers, chiefly for human food, n.
561	Vegetables, dried, dehydrated or evaporated (excluding leguminous
564	Flours, meals and flakes of potatoes , fruits and vegetables, n.e
571	Oranges, mandarins, clementines and other similar citrus hydrids,
572	Other citrus fruit, fresh or dried
573	Bananas (including plantains), fresh or dried
576	Figs, fresh or dried
579	Fruit, fresh or dried, n.e.s.
582	Fruit, fruit-peel and parts of plants, preserved by sugar (draine
583	Jams, fruit jellies, marmalades, fruit puree and fruit pastes, be
585	Fruit juices (including grape must) and vegetable juices, whether
586	Fruit, temporarily preserved
589	Fruit otherwise prepared or preserved, n.e.s., whether or not con
612	Refined sugars and other products of refining beet and cane sugar
712	Extracts, essences or concentrates of coffee and preparations wit
722	Cocoa powder, unsweetened
741	Tea
742	Mate
751	Pepper of the genus 'Pipper'; pimento of the genus 'Capsicum' or
752	Spices (except pepper and pimento)
811	Hay and fodder, green or dry
813	Oil-cake and other residues (except dregs) resulting from the ext
913	Lard, other pig fat and poultry fat, rendered or solvent-extracte
1124	Spirits (other than those of heading 51216);liqueurs and other sp
2222	Soya beans
2224	Sunflower seeds
2225	Sesame (sesamum) seeds

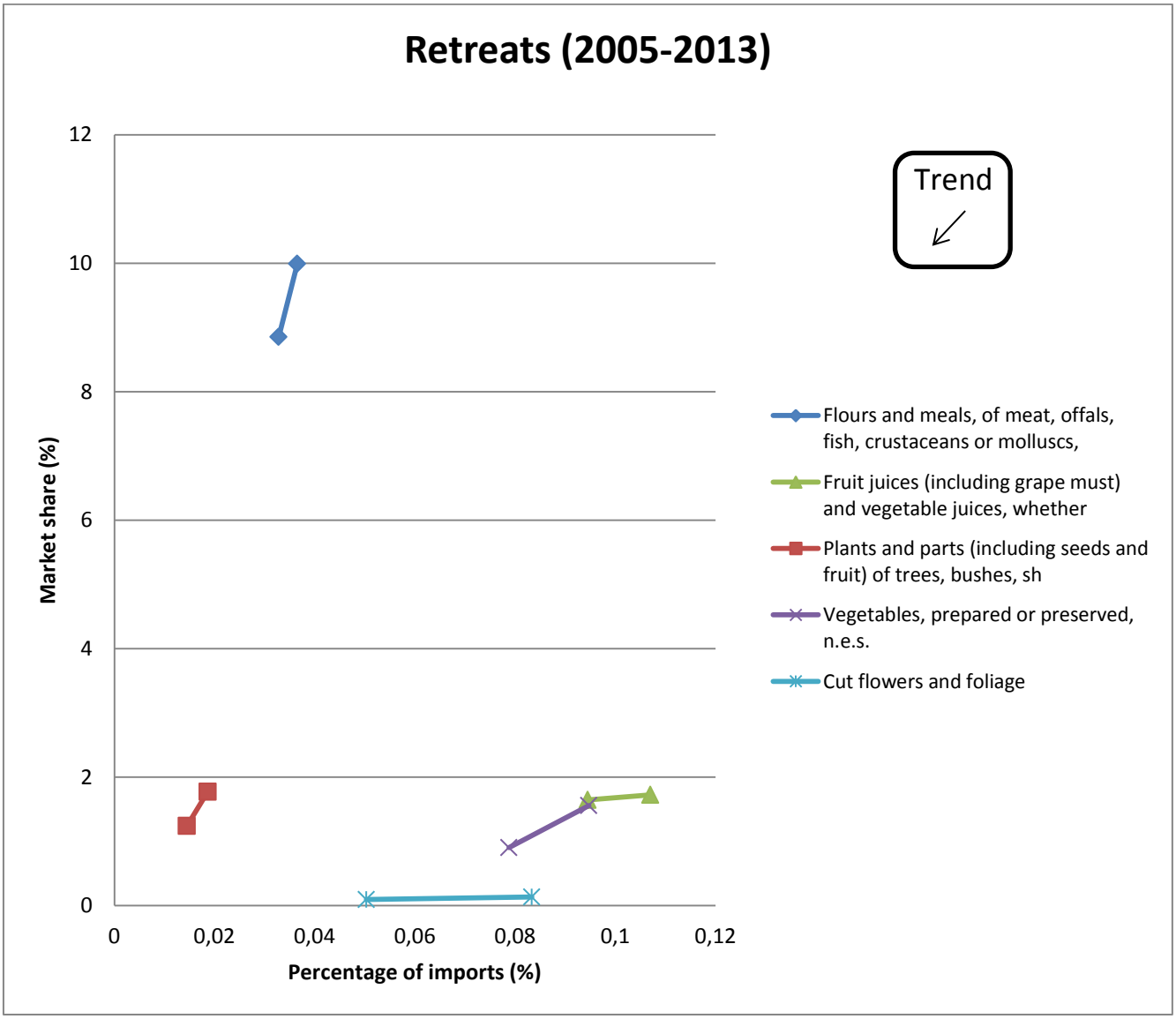
2226	Rape and colza seeds
2923	Vegetable materials of a kind used primarily for plaiting (e.g. c
2924	Plants and parts (including seeds and fruit) of trees, bushes, sh
2925	Seeds, fruit and spores, n.e.s., of kind used for sowing
2926	Bulbs, tubers and rhizomes of flowering or of foliage plants; cut
4113	Animal oils, fats and greases, n.e.s.
4245	Castor oil
4249	Fixed vegetable oil, n.e.s.
4312	Animal or vegetable oils and fats, wholly or partly hydrogenated,
4313	Fatty acids, acid oils, and residues resulting from the treatment
114	Poultry, dead (I.e. fowls, ducks, geese. turkeys and guinea fowls
422	Rice, semi-milled or wholly milled, whether or not polished or gl
545	Other fresh or chilled vegetables
1222	Cigarettes
2927	Cut flowers and foliage
4239	Other 'soft' fixed vegetable oils
4243	Coconut (copra) oil
4314	Waxes of animal or vegetable origin
11	Animals of the bovine species (including buffaloes), live
252	Not in shell
371	Fish, prepared or preserved, n.e.s. (including caviar and caviar
372	Crustaceans and molluscs, prepared or preserved, n.e.s.
411	Durum wheat, unmilled
412	Other wheat (including spelt) and meslin, unmilled
421	Rice in the husk or husked, but not further prepared
452	Oats, unmilled
459	Buckwheat, millet, canary seed, grain sorghum and other cereals,
460	Meal and flour of wheat and flour of meslin
482	Malt, roasted or not (including malt flour)
542	Beans, peas, lentils and other leguminous vegetables, dried, shel
546	Vegetables, frozen or in temporary preservative
574	Apples, fresh
575	Grapes, fresh or dried
619	Other sugars, sugar syrups; artificial honey (whether or not mixe
711	Coffee, whether or not roasted or freed of caffeine; coffee husks
723	Cocoa butter and cocoa paste
812	Bran, sharps, and other residues derived from the sifting, millin
814	Flours and meals, of meat, offals, fish, crustaceans or molluscs,
819	Food wastes and prepared animal feeds, n.e.s.
1212	Tobacco, wholly or partly stripped
2221	Groundnuts (peanuts), green, whether or not shelled

2238	Oil seeds and oleaginous fruit, n.e.s.
4241	Linseed oil

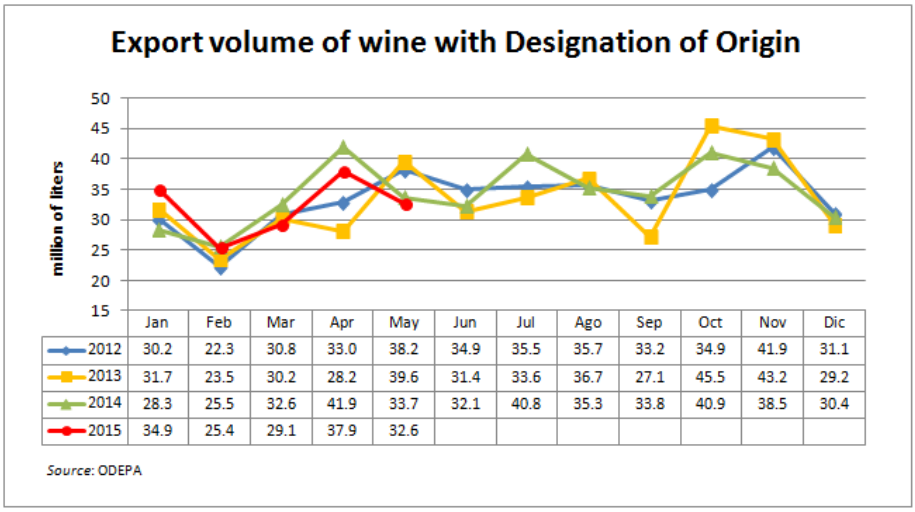



Declining Stars (2005-2013)
Trend
35
30
25
20
15
10
5
0
Market share (%)
0
0,05
0,1
0,15
0,2
0,25
Percentage of imports (%)
Grapes, fresh or dried
Apples, fresh
Fruit, temporarily preserved
Oranges, mandarins, clementines and other similar citrus hydrids,
Olive oil
Wine of fresh grapes (including grape must)


Missed Opportunities (2005-2013)
Market share (%)
1,4
1,2
1
0,8
0,6
0,4
0,2
0
0
0,05
0,1
0,15
0,2
0,25
Percentage of imports (%)
Trend
Maize (corn) , unmilled
Sunflower seeds
Flours, meals and flakes of potatoes , fruits and vegetables, n.e
Non-alcoholic beverages, n.e.s.
Beans, peas, lentils and other leguminous vegetables, dried, shel

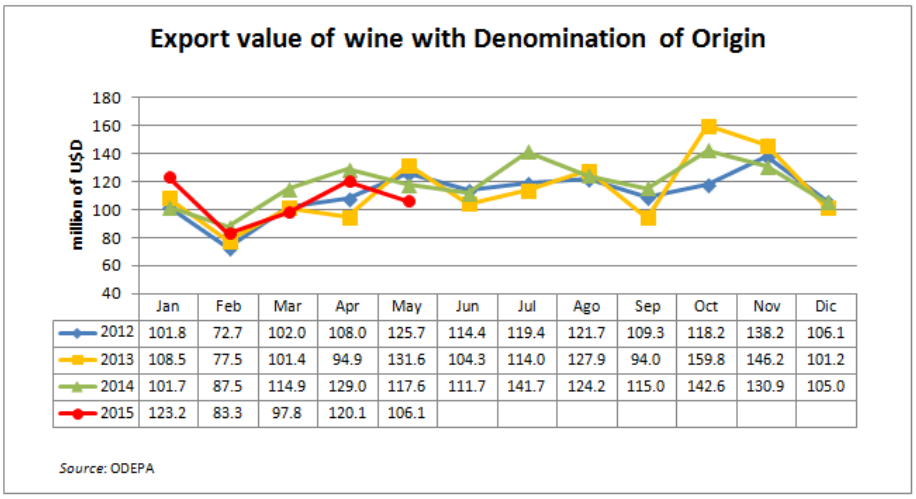

Retreats (2005-2013)
Market share (%)
12
10
8
6
4
2
0
0
0,02
0,04
0,06
0,08
0,1
0,12
Percentage of imports (%)
Trend
Flours and meals, of meat, offals, fish, crustaceans or molluscs,
Fruit juices (including grape must) and vegetable juices, whether
Plants and parts (including seeds and fruit) of trees, bushes, sh
Vegetables, prepared or preserved, n.e.s.
Cut flowers and foliage

Annex 3



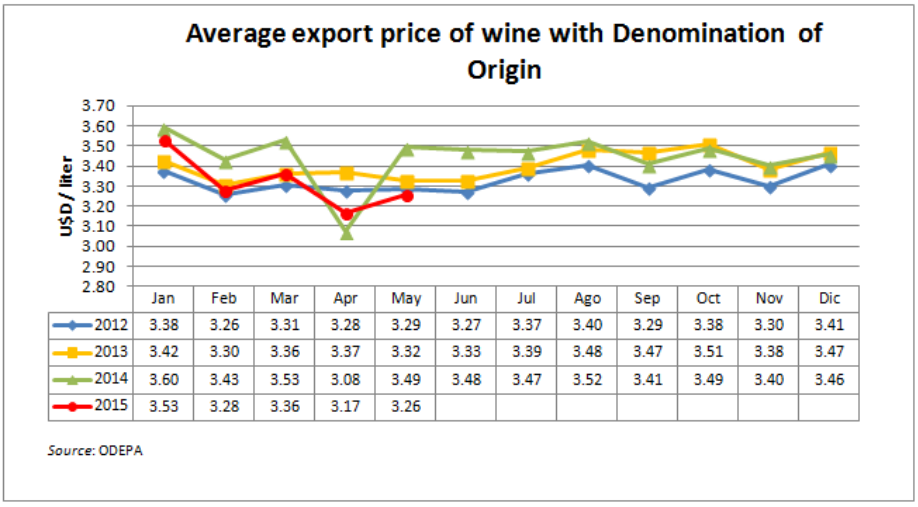
	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
2012	30.2	22.3	30.8	33.0	38.2	34.9	35.5	35.7	33.2	34.9	41.9	31.1
2013	31.7	23.5	30.2	28.2	39.6	31.4	33.6	36.7	27.1	45.5	43.2	29.2
2014	28.3	25.5	32.6	41.9	33.7	32.1	40.8	35.3	33.8	40.9	38.5	30.4
2015	34.9	25.4	29.1	37.9	32.6							

Source: ODEPA



	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
2012	101.8	72.7	102.0	108.0	125.7	114.4	119.4	121.7	109.3	118.2	138.2	106.1
2013	108.5	77.5	101.4	94.9	131.6	104.3	114.0	127.9	94.0	159.8	146.2	101.2
2014	101.7	87.5	114.9	129.0	117.6	111.7	141.7	124.2	115.0	142.6	130.9	105.0
2015	123.2	83.3	97.8	120.1	106.1							

Source: ODEPA

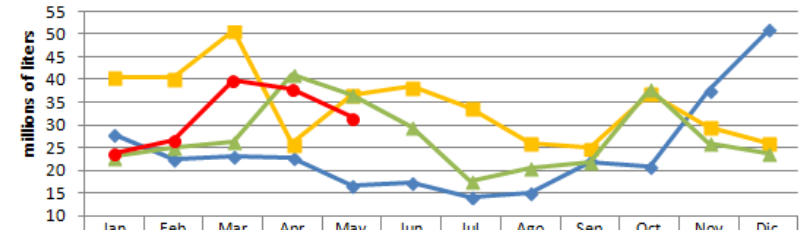


	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
2012	3.38	3.26	3.31	3.28	3.29	3.27	3.37	3.40	3.29	3.38	3.30	3.41
2013	3.42	3.30	3.36	3.37	3.32	3.33	3.39	3.48	3.47	3.51	3.38	3.47
2014	3.60	3.43	3.53	3.08	3.49	3.48	3.47	3.52	3.41	3.49	3.40	3.46
2015	3.53	3.28	3.36	3.17	3.26							

Source: ODEPA

Figure 1

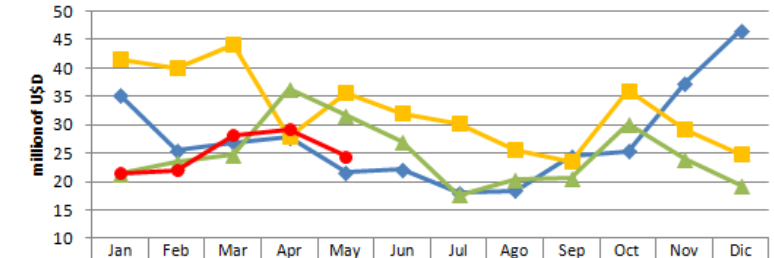
Export volume of bulk wine



	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
2012	27.9	22.5	23.1	22.9	16.6	17.3	14.1	15.0	22.0	20.8	37.6	50.9
2013	40.6	40.4	50.8	25.9	36.7	38.5	33.7	26.1	25.0	37.0	29.7	26.1
2014	23.0	25.0	26.4	41.1	36.6	29.6	17.6	20.6	21.9	38.0	26.0	23.7
2015	23.9	26.7	39.9	38.0	31.7							

Source: ODEPA

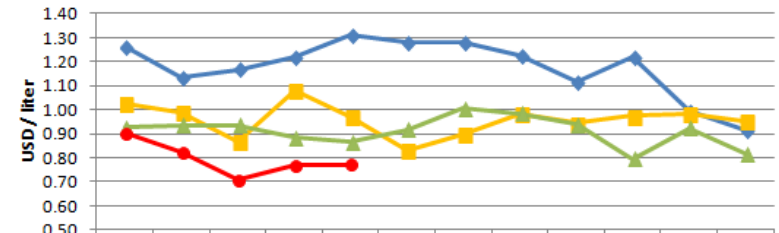
Export value of bulk wine



	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
2012	35.2	25.6	27.0	27.9	21.7	22.2	18.0	18.5	24.5	25.4	37.3	46.6
2013	41.6	40.1	44.1	28.0	35.6	32.0	30.3	25.6	23.6	36.0	29.1	24.9
2014	21.3	23.4	24.7	36.3	31.7	27.2	17.7	20.3	20.6	30.2	24.0	19.4
2015	21.5	22.1	28.2	29.2	24.5							

Source: ODEPA

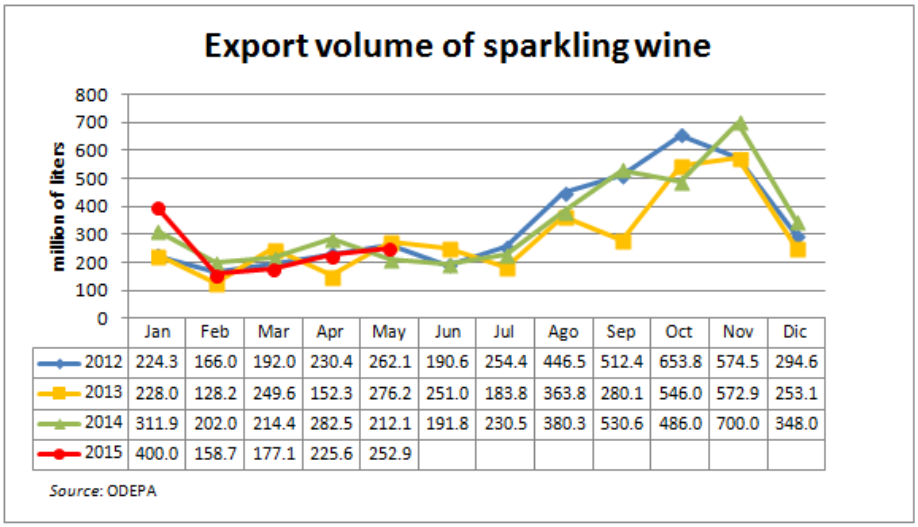
Average export price of bulk wine



	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
2012	1.26	1.14	1.17	1.22	1.31	1.28	1.28	1.23	1.12	1.22	0.99	0.92
2013	1.02	0.99	0.87	1.08	0.97	0.83	0.90	0.98	0.94	0.97	0.98	0.95
2014	0.93	0.94	0.94	0.88	0.87	0.92	1.00	0.98	0.94	0.80	0.92	0.82
2015	0.90	0.83	0.71	0.77	0.77							

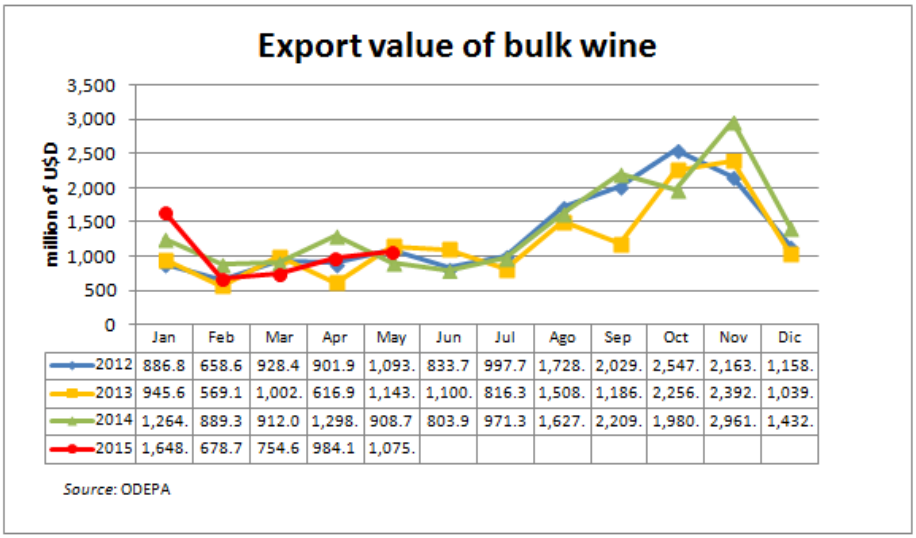
Source: ODEPA

Figure 2



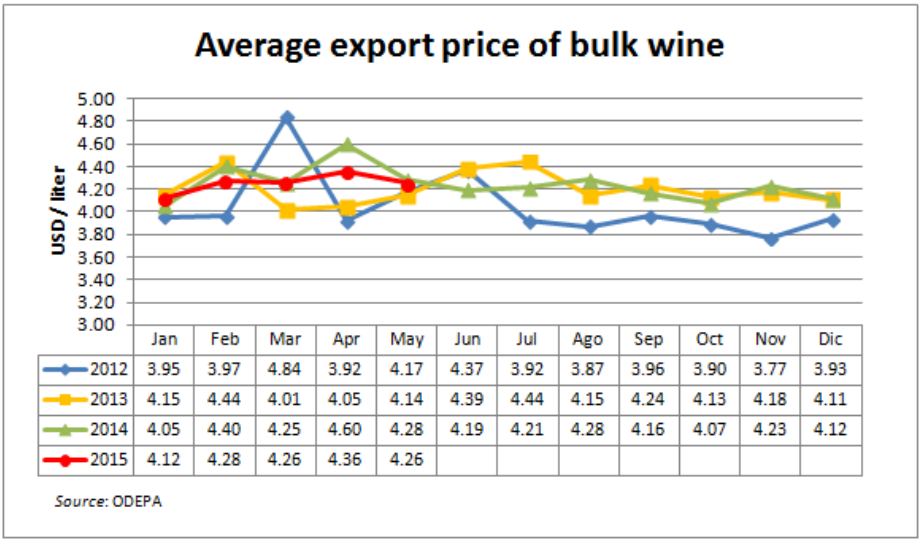
	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
2012	224.3	166.0	192.0	230.4	262.1	190.6	254.4	446.5	512.4	653.8	574.5	294.6
2013	228.0	128.2	249.6	152.3	276.2	251.0	183.8	363.8	280.1	546.0	572.9	253.1
2014	311.9	202.0	214.4	282.5	212.1	191.8	230.5	380.3	530.6	486.0	700.0	348.0
2015	400.0	158.7	177.1	225.6	252.9							

Source: ODEPA



	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
2012	886.8	658.6	928.4	901.9	1,093.	833.7	997.7	1,728.	2,029.	2,547.	2,163.	1,158.
2013	945.6	569.1	1,002.	616.9	1,143.	1,100.	816.3	1,508.	1,186.	2,256.	2,392.	1,039.
2014	1,264.	889.3	912.0	1,298.	908.7	803.9	971.3	1,627.	2,209.	1,980.	2,961.	1,432.
2015	1,648.	678.7	754.6	984.1	1,075.							

Source: ODEPA



	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic
2012	3.95	3.97	4.84	3.92	4.17	4.37	3.92	3.87	3.96	3.90	3.77	3.93
2013	4.15	4.44	4.01	4.05	4.14	4.39	4.44	4.15	4.24	4.13	4.18	4.11
2014	4.05	4.40	4.25	4.60	4.28	4.19	4.21	4.28	4.16	4.07	4.23	4.12
2015	4.12	4.28	4.26	4.36	4.26							

Source: ODEPA

Figure 3

Annex 4

Variety	Area (Ha)									
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Cabernet sauvignon	11 112	12281	13 094	15 995	21 094	26 172	35 967	38 227	39 261	39 731
Merlot	2 353	2 704	3 234	5 411	8 414	10 261	12 824	12 887	12 768	12 879
Chardonnay	4 150	4 402	4 503	5 563	6 705	6 907	7 672	7 567	7 561	7 565
Sauvignon Blanc	5 981	6 135	6 172	6 576	6 756	6 564	6 790	6 673	7 041	7 368
Chenin Blanc	103	106	93	98	104	95	76	49	52	51
Pinot Noir	138	215	287	411	589	839	1 613	1 450	1 434	1 422
Riesling	307	296	317	338	348	286	286	286	283	288
Semillón	2 708	2 649	2 616	2 427	2 425	2 355	1 892	1 860	1 843	1 821
País	15 990	15 280	15 280	15 241	15 442	15 457	15 179	15 070	14 949	14 953
Carmenère	**	**	**	330	1 167	2 306	4 719	5 407	5 805	6 045
Syrah	**	**	19	201	568	1 019	2 039	2 197	2 347	2 468
Cabernet Franc	**	**	17	64	138	316	689	823	869	925
Others	10 251	10324	10 371	10 895	11 638	12 780	14 130	14 475	14 356	14 580
Total	53 093	54392	56 003	63 550	75 388	85 357	103876	106971	108569	110097

source: Servicio Agricola y Ganadero, Gobierno de Chile, 2014.

Variety	Area (Ha)									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Cabernet sauvignon	40 086	40 440	40 789	40 766	38 806	40 728	3 8425	40 836	4 1521	42 195
Merlot	12 942	13142	13 368	13 283	9 656	10 040	10 640	11 431	11 649	11 925
Chardonnay	7 722	8156	8 548	8 733	12 739	13 082	10 834	10 970	10 570	10 693
Sauvignon Blanc	7 741	8 379	8 697	8 862	11 243	12 159	13 277	13 922	14 131	14 392
Chenin Blanc	76	73	76	76	56	56.58	55.78	55.80	55.8	55.8
Pinot Noir	1 440	1 361	1 382	1 413	2 597	2 884	3 306	3 729	4 012	4 059
Riesling	293	305	305	305	333	367	400.25	409	442	424
Semillón	1 715	1 708	1 727	1 719	779	846	929	958	920	902
País	14 865	14 909	14 955	15 042	3 374	3 868	5 855	7 079	7 247	7 338
Carmenère	6 545	6 849	7 183	7 284	8 248	8 826	9 501	10 040	10 418	10 732
Syrah	2 754	2 988	3 370	3 513	5 390	6 027	6 886	7 393	7 744	7 933
Cabernet Franc	1 056	1 099	1 143	1 177	1 226	1 320	1 345	1 450	1 533	1 591
Others	14 821	15 038	15 250	15 385	10 264	11318	15 371	17 667	18 389	18 116
Total	112 056	114 448	116793	117559	104 717	111525	116830	125946	128637	130361

source: Servicio Agricola y Ganadero, Gobierno de Chile, 2014.