

The wine chain in Argentina: influence of the Production- Consumption dynamics

The main structural elements of the wine chain are: Vineyard, Cellar (elaboration of wines), Sale/Shipments, Demand/Consumers and Price.

Vineyards and Cellars (Regiones Vitivinícolas Argentinas 1997)

The region dedicated to viticulture constitutes an extense band with a variable slope from 22° to approximately 40° south latitude. The climate is, in general, of a continental character, half deserted with a dry winter season, warm or cold-warm, with precipitations in the summer period which vary between 100 and 300 mm annually. The relative low humidity adding to scarce precipitation (that necessarily oblige to an irrigated agriculture) constitutes an exceptional condition for the quality and the sanitary state of the grapes. The products are practically natural and free from pesticide residues. The regions present diverse characteristics, from sandy to clayey with a predominance of loamy and profound soils. The region can be divided in three well-defined regions:

1. Central-West region

This region represents 91.45% of the vineyards in the whole country. It extends from 29.5° to 36° South Latitude. The cultivation of the vine is higher than 500 m above the sea level. There are two sub-regions with distinctive features: Mendoza and San Juan.

Mendoza

In the last decades, it has reached a great development shown in the improvement of the vineyards and the technology. The pink varieties are: Criolla Grande, Cereza, Moscatel Rosado and Gewurztraminer. The last one is destined to the elaboration of fine quality wines. The red varieties are: Malbec, Cabernet Sauvignon, Merlot, Syrah, Pinot Noir, Barbera, Sangiovese, Tempranilla and Bonarda, among others. The white varieties are: Chenin Blanc, Torrontés Riojano, Ugni Blanc, Semillón, Tocai Friuliano, Chardonnay, Riesling, Sauvignon Blanc, Moscato Bianco and Pedro Giménez, among others. The following areas are distinguished:

North Area. It is different because of its soil and climatic characteristics as well as for vine varieties. The climate is warm with approximately 200 days free from frost. Pink varieties are cultivated and Pedro Giménez is the predominant one among the white varieties.

Central Area. It has extraordinary ecological conditions for the viticulture. The warm climate, which varies from a cold warm to a hot warm one as we advance from the south to the north, is suitable to allow the best maturation of the grapes. In Luján de Cuyo the vine is cultivated in the foothill of the chain of mountain, higher than 850 m above sea level, in excellent ecological conditions. The cultivation of high quality varieties such as Malbec

predominates; and the soil and climatic conditions exalt its oenological characteristic giving origin to fine wines of great singularity. There is a high technological system that together with the best ecological conditions and the kindness of the cultivated varieties have allowed this area to produce red fine wines. Pink and white wines of a superior quality are also produced. Nowadays the Luján de Cuyo and Maipú Appellation of Origin are functioning.

The East Area. The climate is warm and it has a regime which is superior to 2,200 sun hours in a period of 210 days that are favorable for the vegetative development allowing a perfect maturation. This area has made a remarkable progress in the management of crops, irrigation systematization, incorporation of technologies and modern equipment in wineries as well as in must factories.

The Valle de Uco Area. The altitude varies from 900 m above sea level in Tunuyán City to 1,200 in the Old Tupungato. The daily thermal amplitude is about 15° C, favoring a good color and tannin grape production. It allows disposing of appropriate raw materials to get wines destined to a long aging. The notable quality of the red fine wines mainly Malbec deserves a special distinction. These varieties reach an excellent quality level in the Tupungato Valley. In general the wines produced in this area have a high acidity. The producers of Tupungato have organized themselves to constitute the Tupungato Valley Appellation of Origin.

South Area. It is situated at the foot of the main mountain. In general this area offers excellent climatic and edaphic conditions for the cultivation of vines. The southern producers have organized themselves below the system of Appellation of Origin known as San Rafael.

San Juan

The viticulture is mainly developed in the Tulum Valley and in the Zonda and Ullum Valleys. The altitude is 630 m above sea level. The climate is warm and stable. The rainfall is scarce. In spring it is common the blowing of Zonda which is dry and hot. The pink and white varieties predominate. Another important marker is the adoption of high technology which actually allows the production of good quality fine wine. San Juan is where liquor wines are preferably produced due to the high sugary wealth that the raw material reaches.

2. The Northwest Region

The cultivation of the vine finds its better expression in the mountain irrigated valleys which have an altitude of about 1,000 and 2,000 m, such as Cafayate in Salta, Andalgalá and Tinogasta in Catamarca and Chilcito in La Rioja.

Calchaquíes Valleys. The most widely cultivated variety is Torrontés Riojano. Due to its bouquet and characteristic flavor, it produces a wine of a great typicity. In this viticultural area Cafayate is known as the main producer center. The production of fine wines of great quality is important, mainly the white ones elaborated with aromatic grapes of the variety Torrontés Riojano, which gives them an intense floral characteristic bouquet.

La Rioja. The vineyards are formed mainly by white and pink varieties. The Chilcito Department has the major surface of the province. Regional wines are produced predominantly white, golden yellow, alcoholic, a bit acid, lightly sweet and very aromatic. Fine wine are also elaborated that is why harvest is anticipated, obtaining wines of a superior quality, light yellow and with an intense aroma but more delicate than the traditional regional wine. Nowadays the Appellation of Origin Valles de Famatina is functioning.

3. The South Region

It is the Southernmost Argentinean viticulture region and it is the one which is situated at the lowest altitude. Different well defined sub-regions can be demarcated principally by Alto Valle del Río Negro. It concentrates approximately 80% of the viticulture surface of the region. Red and white varieties are cultivated. As the climates are colder than in the previously mentioned regions, the musts are characterized by a higher acidity that includes a high proportion of malic acid and less sugary wealth...

In Argentina the cellars concentrate the biggest part of vine industrialization. The renewing process occurred in '90, fomented fusion, sales and incorporation of new members; this new situation marked the differences between the cellars. Consequently, very little cellars concentrate a big part of the market.

The Argentinean viticulture enterprises use to have some trademarks to different market segments. Every time, there are less enterprises with familiar or national capital than before; only few cellars are in the hand of their first local owners. Between 1978 and 1991 54,000 hectares of old vines were eliminated, while around 37,000 hectares of new fine vines were planted. Even so, they integrated a technology packet (mechanization, climate protection, sanity) that allowed a better standardization process. (Cetrángolo et al. 2002). The final consumer has been benefited by the actual scene of new competitors. The wine cellars which present their wines according to foreign consumer are increasing progressively. These wines are highly valued and gain prices in international competitions of acknowledged prestige. Moreover the classic variety wines, for instance Cabernet Sauvignon and Chardonnay, it has been opted for a re-value of the wines of the Malbec variety, which Argentina elaborates with world recognition since such variety has founded in Mendoza its best habitat. The organization of producers, within the system called Appellation of Origin (DOC) constitutes a field of authenticity and a guarantee of indisputable superior quality

Sale/Shipments

Sale effectiveness depends on the attractiveness (availability, price, quality) of the product in the marketplace. Sales do grow, but unanticipated interactions of the different organizational functions create severe problems. The optimization of the material flow, information and stocks into the different parts of the chain is an objective desired to avoid delays and supply excess, design the production and help to a general organization (Cetrángolo et al. 2002).

In Argentina the fine wine are distributed by some channels: cellars, hyper/supermarkets, wineries, hotels, restaurants, bars, wine bars, clubs and internet. The most percentage of fine wine consumption (85%) is canalized by the intermediate clients (wholesales, supermarkets, warehouses and wineries) and the 15% by the institutional clients (bars, restaurants and hotels).

Demand/Consumers

Although there is a general decrease, the major fall in the sales affects the inferior extreme of the market as regards qualitative terms, since it is perceived and increase in the local markets concerning fine and sparkling wine. Despite this reduction of consumption, the

shrinkage occurred in the production because of the decrease of the cultivated area, and brought about sort of balance between both of them, which keeps away the ghost of surplus. Nowadays the expectancy in the existence of wines from former crops in wineries reaches volumes which according to the evolution suffered by the consumption in our country, and also taking into account the progress of exportation, supposed an enough technical stock, in order to reply satisfyingly to the demands of the internal and external markets (Situación Actual de la Vitivinicultura Argentina 1997).

The cellars which focus to the consumer's satisfaction will be those ones that will have the most success. The most important link in the Production - Consumption chain of a product is the consumer, for whom the product is produced. The goal is to discover coming trends or latent consumer needs. The most salient sensory properties of the wines flavors are investigated using descriptive analysis with a trained panel (Zamora and Guirao 2002a, b).

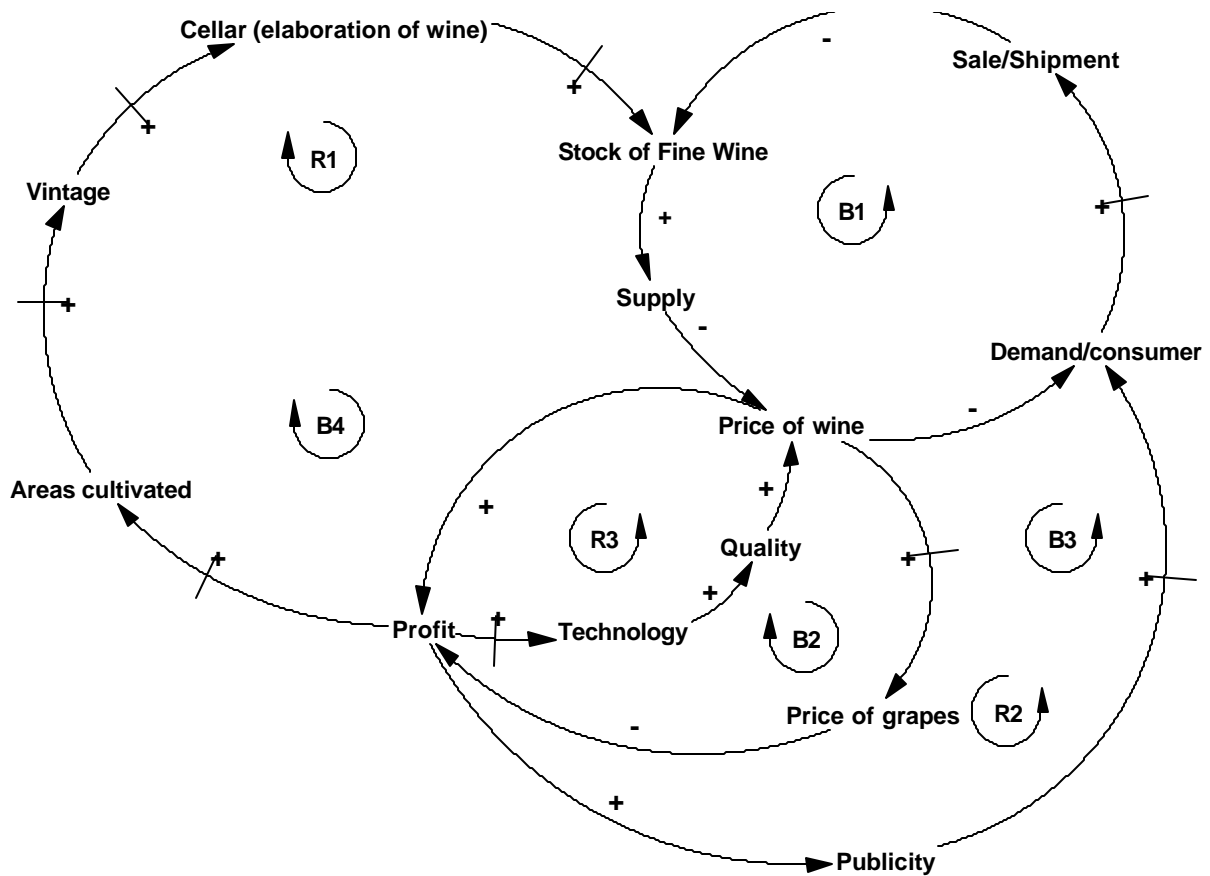
Actually in Argentina the shipment sector have the major information, because it is the nearest link to the consumer. Food quality provides a challenge for communication about the product, not only to induce consumers to buy the product, but also reinforce their choice after the purchase. In order to make purchase decisions, consumers have to form quality expectations. After the purchase has been made, the product will lead to some kind of quality experience. The relationship between quality expectation and quality experience is commonly believed to determine consumer satisfaction with the product and, hence, the probability of repeated purchases (Grunert 2002).

Price

The price role is extremely important in the operation of wine chain and it coordinates the chain actor's decisions. They make their decisions using the current price and their expectation of future price (Méndez Acosta and Alonso Magdaleno 1999). The wine market and the Commerce Stock Exchange of Mendoza are the first entities where the prices are fixed in Argentina. The great supermarkets have an important role in the fixed of the price because they establisher a band where the price oscillates in concordance with their specific objectives.

The supply and demand didn't mind at the '90. After the renewing experimented by the Argentinean viticulture, the wine market began to be manager by the demand, which was decreasing in quantity but improving in quality and specialization. These tendencies were together with a stable supply (Cetrángolo et al. 2002). The delays in the transmission of the price are common and they are confounded with the shortage of information inside the production and distribution system. That lack of information is typical in the incentive mechanisms based on the prices inside the agricultural systems. That lack punishes asynchronously to the producers and the down-stream industry participants because it breaks into fragments the coordination of functions and it limits the endogenous assignment of resources that generate value inside the system (Cloutier et. al. 1998, 1999).

Fig.1. Causal diagram of fine wine chain adapted from Declerck and Cloutier 2002



Causal diagram presented in Fig.1 consists of four balancing feedback loops (denoted B1, B2, B3 and B4) and of three reinforcing feedback loops (denoted R1, R2 and R3). The balancing loops B1 and B3, and the reinforcing loop R2 show the structural interaction among Demand/consumer components. The balancing loop B2 and reinforcing loop R3 show the interaction Quality-Price. Finally, the reinforcing loop R1 and balancing loop B4 show the correlation Production-Price.

The balancing loop B1 comprises 5 elements: Stock of fine wine, Supply, Price of wine, Demand/Consumer and Sales/Shipment.

B2: price of wine, price of grape, profit, technology and quality.

B3: profit, publicity, demand, sale, stock of fine wine, supply, price of wine and price of grape.

B4: profit, areas cultivated, vintage, cellar, stock of fine wine, supply and price of wine.

R1: profit, areas cultivated, vintage, cellar, stock of fine wine, supply, price of wine and price of grape.

R2: profit, publicity, demand, sale, stock of fine wine, supply and price of wine.
 R3: price of wine, profit, technology and quality.

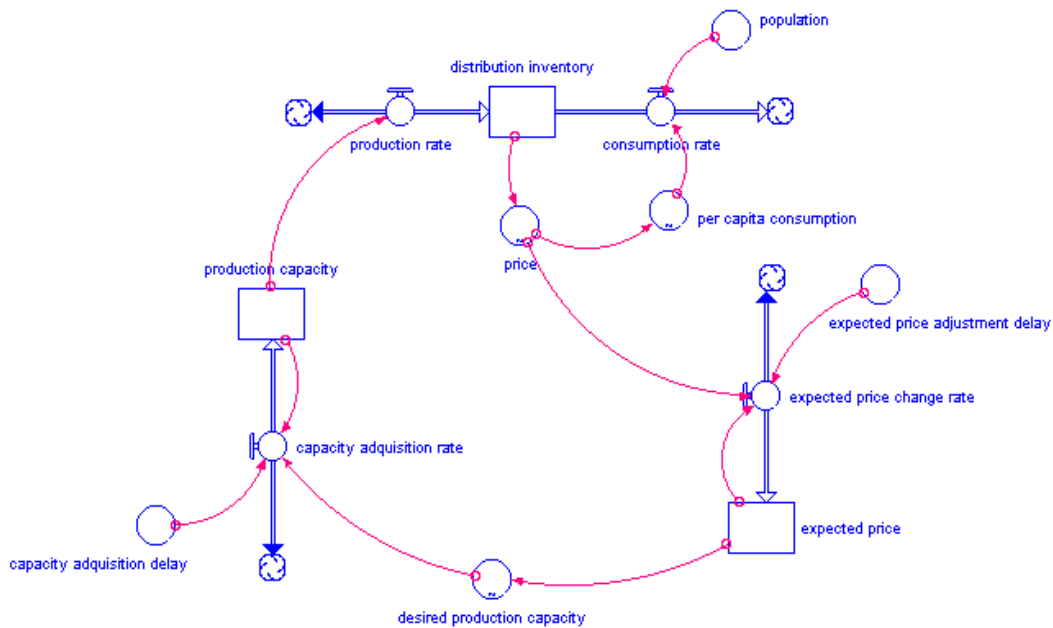
Causal diagram (Fig.1) captures the main structural details of the Fine Wine chain. The influence of grape price modifies the dynamic going from a balancing loop B4 to a reinforcing loop R1. The same situation is observed with B3 and R2. To study the dynamic behavior observed in the Fine Wine industry in Argentina is important to focus in the Demand/Consumer element. It can be observed a delay between the Demand and Sale giving place to a chain break which is due to the distance from real behavior. The information comes too late to advance in the changes and the value put on a product by the consumers depends on the degree of product-information that is available to them.

If the producer and the processor obtain quicker (and more purified) the consumption information, the supply chain will be able to work more coordinately.

The non linear and cyclical dynamics of Wine Chain make System Dynamics an appropriate method to analyze this chain in Argentina.

Using system dynamics a model will be elaborated that will pick up the operation of the supply chain, feedback and non-linear relationships to explain the coordination mechanisms among the different actors. Diversity of production methods and product qualities exists. For that, it should be described it completely their operation to be able to reflect him appropriately in the pattern. The material and information flow it is picked up next. To explain the operation of this agricultural chain, it is used the “commodities” production cycles pattern developed by Goodman 1974. The same one, a model of third order, is presented in the Fig. 2.

Fig. 2. “Commodities” Generic Model. Goodman 1974



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