Introduction and Overview

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Who would have thought in 1990 what we would be able to achieve in 20 years? VDQS, the abbreviation neglected by the wine authorities, has become the beacon for the **V**ineyard **D**ata **Q**uantification **S**ociety.[i] It was founded by a group of academic researchers coming mainly from applied econometrics and members of the AEA (Applied Econometrics Association, founded in 1973) and was based on the challenge of developing knowledge contributions on the economics of the wine and grape sector. After more than twenty international conferences our initial challenge can be regarded as largely successful. Each year new studies, scientifically validated by a rigorous process, are providing new elements of reflection (and action) to the decision makers of the wine world.

When Henri Serbat, abusing his authority as president of the VDQS-EuAWE, suggested the time had come to collect the best research papers in order to create a handbook, we immediately fell agree. We did not realize the magnitude of the task to make such a reference. But today we are able to offer you a collection of work that embraces all economic aspects of wine sector. The sixteen following chapters show the richness of the contributions of economists in their preferred area (not only for tasting). The presented works of this book have in common the use of econometric techniques and mathematical formalization to describe the new challenges facing today consumers, producers (growers and traders), investors and the public regulation of the sector. Some of the discussed topics have been recently developed by economists (e.g. global warming, wine tourism, etc.) although they were formerly mostly covered by specialists in management, marketing and geography. Other fields correspond to new investigations of traditional topics (e.g. ranking wines or consumers' behaviours) and new analyses in strategic choice (e.g. how to bottle wine or to sell bulk wine, to select grape varieties at replanting, to distinguish attitudes, intentions and behaviour in exporting). This book is also the opportunity to make an inventory of the positioning of the different market players and to explore the alternative of regulations for public policy.

The book begins with alcohol consumption and welfare purpose by analyzing the characteristics of demand in the wine and the alcoholic substitutes, which provide a considerable satisfaction to consumers without being regarded as basic necessities. The chapter by Jan Bentzen and Valdemar Smith analyses such originality focusing on drinking patterns and their change in OECD countries through the relationship between alcohol consumption and self-reported indices of life satisfaction. These authors argue that changes in drinking patterns can affect life satisfaction both negatively and positively. A detailed survey of literature on the link between income and happiness is followed by a model for happiness-alcohol relationship including controls for shifts in aspirations. A panel data set for 21 OECD countries covering the entire period 1961-2005 is used to obtain empirical measures of the different effects. The results may help explain the demand for alcoholic beverages, both in terms of level and structure, a particularly complex phenomenon which really depends on a series of variables that go well beyond the consumer income and changes in prices and product features. The chapter by James Fogarty clarifies the economic measure of consumer satisfaction and describes the loss of "welfare" created by coercive taxation and artificial increase in prices policy. The author develops an original optimal alcohol tax model which distinguish three types of consumers: moderate, informed (on private cost of consumption) abuser and uninformed abuser. Introducing specific rates for beer, wine and spirit, the used approach balances the savings from externality cost reductions due to alcohol taxations against the welfare losses that alcohol taxes impose on responsible consumers. Based on Australian data, current alcohol taxation approaches are evaluated, and estimates are presented of the welfare loss associated with current approaches versus optimal alcohol tax rates. The chapter by Ruben Hoffman and Yves Surry analyze how advertisement expenditures influence the demand for alcoholic and non-alcoholic beverages in France. Using annual data for the period 1977-2004, a conditional dynamic demand system are estimated econometrically for spirits, champagne and sparkling wines, still wine, beer and non-alcoholic beverages. Advertising expenditure is modelled as affecting per capita demand for alcoholic and non-alcoholic beverages through a translation parameter. Special attention is given to the impact of the Evin law implemented in 1991 in France which restricted the use of advertising for alcoholic beverages. The results show that the law has affected consumer demand for alcoholic beverages and support is found for the existence of subsistence levels which in the model is captured by translation variables.

The second part of the book focuses more on consumers' behaviours and prices. Indeed, the price of wine appears to be explained by a multitude of considerations related to changes in agricultural production, but also by an especially difficult to control demand of consumers. Jean-François Outreville thus illustrates this paradox by showing how it is even difficult to postulate a correlation (ceteris paribus) between the size of the bottle and the selling price of the product. Does the bottle size affect the price? In order to answer this question, the contribution investigates the relationship between price and the size of the bottle for the same wine, controlling for vintage and quality. Different kind of data is collected: posted prices found on company's websites for Champagne and auction hammer price from the Chicago Wine Company for Bordeaux wine. The results show that in the case of Champagne, the posted price of bottles increases more than proportionally with the size of the bottle. This relationship is verified independently of the perceived quality of the wine (producer, vintage) or the region of production. It is postulated that the hypothesis of scarcity may be explaining this relationship. However, investigation based on prices determined at auctions for Bordeaux wines mitigates these results as the premium for larger bottles is much smaller than for posted prices. In the following chapter, Hyunok Lee and Daniel A. Sumner develop an analysis of the economic value of wine names through place names or geographic indicators used to identify wines. Given that region of origin is difficult or impossible to duplicate, they investigate the place name "Champagne" in the sparkling wine market in the United States. Using an econometric model they measure the price effects on using this place name and compare the prices of wines from Champagne relative to other French sparkling wines that do not claim the place name "Champagne". In this chapter, the authors explore an econometric approach within a hedonic price framework using data on sparkling wines collected from the *Wine Spectator.* The model includes wine characteristics such as the label name, the region, the score, the vintage and the release year. They establish that the place name Champagne systematically translates into much higher prices. Matteo Galizzi then proposes to better understand the economic rationality of the consumer for the purchase of a hedonic product. In a meticulous literature review, the author develops the need to appeal to the behavioural sciences to understand the hidden rationality of consumer satisfaction and show how the product can be influenced by many parameters that go well beyond the price, and on both the quality and a set of specifications for the labelling and reputation. The experimental analysis is founded on a numerous and precise qualitative and quantitative information given by three wine-guides in Italy edited by the *Associazione Italiana Sommelier*, the *Seminario Permanente Luigi Veronelli* and the *Slow Food-Gambero Rosso* (aromas, awards, grape variety, regional provenance, prices, experts ranking ...). An empirical analysis founded on a probit model give a contribution which reports numerous evidence on the most significant determinants of actual wine judging in Italy. In this line, Pascale Bazoche, Pierre Combris, Eric Giraud-Heraud and Jean-Baptiste Traversac illustrate how experimental economics better clarify the role played by labelling and quality certificates on consumer demand. These authors propose to estimate consumers' willingness to pay (WTP) for wine characteristics using incentive compatible laboratory experiments with participants randomly selected from the general population in France and Germany. The main question is to identify the value of a supposedly well known Appellation of Origin (namely "Appellation d'Origine Contrôlée Bourgogne"). Results show that sensory characteristics and label information influence differently French and German consumers. They also reveal that Appellation of Origin information is of little value outside the country of origin for middle range wines. Moreover, it appears that the small differences observed in average WTP for each wine, in each country and information condition do not result from consumers' lack of discrimination.

The third part of the book addresses wine ranking and financial issues and permits to better understand consumer behaviour by using the fact that it is known that the various buying guides, rankings, and other public certificates of quality abound in the area of wine more than any other food sector. However, how to account for a very high heterogeneity of possible judgments, even from renowned experts of the profession of oenologist? Michel Balinski and Rida Laraki show how the problems of aggregation of judgments, traditionally regarded as inextricable from the Arrow paradox, however, can be solved by innovative methods. In the case of wine tasting, based on the data of the famous wine tasting organized in Paris on May 22, 1976, the authors show that the traditional methods for ranking wines give too much importance to extreme opinions – very high ones or very low ones – and so often do not arrive at truly consensual decisions. Hence, a new method of aggregation is presented, and why it is better than any known method in theory and in practice is explained. Called *majority judgment,* its use in several scenario of marking by judges is described, revealing that the method is meaningful, strategy-proof-in-grading, partially strategy-proof-in-ranking, coherent thus difficult to manipulate. Particularly, they show that in fact at the time of the "Jugement de Paris" in 1976![ii], California did not defeat Gaul! Then research in social choice may allow challenging the rankings as famous as that of Bordeaux wines made in 1855. What is known is the importance of such classification in the behaviour of the various stakeholders in the economy. Indeed, in the case of super premium and icon wines, this type of classification is not a simple guide to the consumption of a food product, it is also (and perhaps especially) a financial investment guide for investors and speculators disinterested in the hedonic pleasure, yet essential to the economist who wants to understand the operation of markets. Philippe Masset and Jean-Philippe Weisskopf clarify this view by establishing the opportunity and the specificity of such a financial product and its profitability. After a presentation of investing in estates or companies active on the wine market, they show how a small number of bottled fine wines are now viewed as an integral part of a variety of assets that are at an investor's disposal. Research questions consequently tend to look at the interaction between wine and other asset classes, portfolio diversification benefits, differences in risk components of wine as well as its behaviour across economic cycles. This chapter synthesizes results on these different topics (international market and trade, associated costs and taxes, characteristics of carefully selected bottled wines, choice of investment-grade wines, creation of wine-indices and wine-funds, duration of wine investment ...) and tries to give an up to date view of the specific market for fine wine. Paul Amadieu, Jean-Pierre Couderc, and Jean-Laurent Viviani examine the investment policies and financing implemented by the French wine business in times of crisis and especially in link with the business cycles. This study includes a description of these policies and their consequences on the financial performance of these companies: level of cash (and ability to maintain it), financial profitability and possibly financial risk. Taking into account the dynamic of financial structure, investment policy and cash management, authors show why it is difficult to understand the consequences of the crisis for each company in this sector of economy. They stress on the sensitivity of the financial performance to the business cycle and four aspects are particularly examined: working capital management, human resources, financing and investing policy.

The fourth part of the book discusses intermediary markets and strategic decisions of wine growers. The different chapters address both marketing and the technical efficiency of the strategic choices of production. The first situation exposed by Tim Coelli and Orion Sanders concerns Australian wine grape growers who have faced difficult market conditions in recent years (reductions in grape prices, increases in irrigation water prices having a significant effect on farm profitability) and then supported a significant pressure to be as efficient as possible. An exploratory study using a subset of the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) irrigation survey consisting of data from the Murray and Murrumbidgee River basins in Australia permits to estimate production frontiers and the efficiency levels of the individual farmers. Another field is developed by Gordana Manevska-Tasevska about the influence of grape assortment in terms of assortment size and product function/product consistency on the technical efficiency of grape-growing family farms in Macedonia. This subject is of great interest and importance while decisions have to be taken for restructuring and modernizing viticulture for the winemaking Western Balkan Countries (WBCs) and the Early Transition Countries (ETCs). Rural development programs have encouraged grape producers to uproot old vineyards consisting of regional/local grape varieties and replace them with recognized European grape varieties. They need to develop a long term strategy with a compromise between table grapes and wine grapes; moreover, adjustments to match EU regulations and practices, including wine regulations, are considered to be the key to improving the competitiveness and environmental sustainability of the Macedonian wine sector. A two-stage Data Envelopment Analysis (DEA) method extended with bootstrapping is applied to the three-year average (2006-2008) of a panel dataset for 300 farms. The analysis reveals very high potential for revenue increases. Farmers with lower variety diversification, specializing in growing local and regional varieties and table grape varieties, achieved higher efficiency. The results lead the author to suggest that the on-going revitalization and investments in Macedonian grape assortment should primarily be directed towards regionally recognized and table grape varieties. In the following chapter, based on the population processing wineries in Italy, Giulio Malorgio, Cristina Grazia, Francesco Caracciolo and Carla De Rosa investigate the interest for producers to adhere to product certification systems, emphasizing quality over quantity marketed. Concerning Geographical Indications (GIs), this chapter aims at empirically investigating wineries' strategic choice of bottled volumes. Starting from a dataset covering the whole population of Italian wineries having processed wine in 2008, the authors estimated a sequential probit model to characterize wineries long and short term strategies. Notably this model is applied to examine the influence on bottled volumes of GI wines of winery's size, structural and organizational characteristics, procurement characteristics, territory, and winery's product range. Results show that high-volume strategies are likely to be favoured by scale economies in the processing activity and scope economies arising from sourcing grapes from multiple geographical areas and suppliers. Moreover, the results empirically corroborate the volume-constraining nature of DOC/DOCG with respect to IGT, this latter allowing greater "flexibility" in exploiting market opportunities. Finally, the authors provide some concluding remarks on the possible product development and marketing strategies for Italian GI wineries. In a sample of Spanish wineries, Isabel Bardají, Belen Iraizoz, Julio Estavillo noting the trends in demand and trade and the profound transformation of the wine industry that has been observed in recent years, consider that the move towards foreign markets appears inevitable but foreign market entry represents a major break from the usual business approach of producers. Changes in the decision-making process require behavioural modifications which may react to the increasing difficulty of selling to the domestic market (due to seeking new markets and increasing exports). The authors especially interested in strategic decisions focus on the motives underlying decisions by exploring the internal determinants of export behaviour. Their analysis consists in explaining the relationship between attitudes, intentions and behaviour. The primary purpose is to identify the explanatory factors of the export intentions of Spanish wineries. An additional contribution of this paper is to test the TPB (theory of planned behaviour) in the formation of export intentions. By using the ordinary least squares (OLS) method, with a stepwise technique in order to determine the export intentions, prediction of specific export intentions are obtained with a two-stage procedure. The results show that exporting is a key issue for most wineries facing a competitive environment, although the domestic market continues to be the main outlet for most. The main finding suggests that export intention varies across firms, ranging from an active export strategy to the consideration of exports as a possibility. Some variables influencing the wineries intentions have been identified.

The last part of the book is devoted to new issues that have hitherto given a very limited number of publications in the literature on wine economics. Francoise Bensa and Marie-Claude Pichery explore how the renewed interest in local agriculture (due to a specific demand of consumers and the need to consider the carbon footprint of food) can promote the on-site or direct wine sales and stimulate wine tourism. The authors argue that studies carried out by national and local tourism boards show that the classic tourist, in a wine region, is not satisfied with just buying a product anymore: instead, he/she expects to have an unforgettable experience, by visiting the vineyards and meeting directly with producers. Because of this new phenomenon, winemakers now have to go beyond just working among the vines or in the cellar, and have to adapt to those new tourists and develop marketing skills. By using the method of structural equation applied to two surveys in France (Burgundy and Alsace) among winemakers, the chapter draws an accurate, up-to-date portrait of the wine tourism-related activities implemented by winemakers and evaluates the consequences of these activities on on-site sales. The analysis of the sample shows, in Burgundy like in Alsace, that if the wine tourism activities offered by the winemakers do not have an influence on on-site sales in the short term for individuals, they permit the creation of a relationship of confidence with the consumer that eases the growth of customer loyalty and the increase in sales in the long term. This shows that in fact the wine tourism activities are important to attract consumers and to build a relationship with the domain. These are the principal motivations declared by winemakers to offer wine tourism activities. As a result, the three principal elements that push the development of these activities are by order of importance: increase direct sales, create customer loyalty, and attract new customers. Finally, the last chapter, proposed by Julian Alston, Kate Fuller, James Lapsley, George Soleas and Kabir Tumber allows us to take a lot of issues developed in this book, by placing them within the major challenge of global warming. These authors show how it is possible to distinguish the change of the external economic environment of the deliberate strategy of companies to increase the alcohol content of wines offered to consumers. Indeed, many economists and others are interested in the phenomenon of rising alcohol content of wine and its potential causes. Has the alcohol content of wine risen—and if so, by how much, where, and when? What roles have been played by climate change and other environmental factors compared with evolving consumer preferences and expert ratings? The authors explore these questions using international evidence, combining time-series data on the sugar content of wine-grapes in the United States and on the alcohol content of wine from a large number of countries that experienced different patterns of climate change and influences of policy and demand shifts. They conclude that the alcohol content of wine has increased significantly, and that this increase can be attributed more to decisions made by grape growers and winemakers than to any exogenous effects of climate change.

This chapter from Alston et al. can clearly highlight the role of economic and social analyzes in the wine sector. It seems that the understanding of economic mechanisms and strategic decisions of stakeholders throughout the supply chain provide new perspectives on the evolution of this agriculture sector. Formalized approaches that are presented throughout this book are used to measure these effects and facilitate critical analysis of the ideas defended by their authors. If the wine is an emblematic example of the agrifood sector, it is, moreover, a particularly fertile field of investigation to test economic theories, statistical methods and operational research analyzes. This is the whole point of this book that we hope will merit to satisfy a wide audience of social scientists, professionals and regulators of the wine industry and, of course, all wine lovers!

Notes

[i] VDQS = '*Vin Délimité de Qualité Supérieur*' is a French certification system abandoned in 2012 in order to simplify the labelling of wines.

[ii] The "Jugement de Paris" (May 24, 1976) declared that California dethroned the greatest wines of Burgundy at a blind tasting, while the jury was exclusively French. This day marks the discovery of the "New World" wines for the often reactionary international commentators' palates.