The use of long-term contracts in grape procurement – a study of current practices in the D.O. Ribera del Duero

Index

1. Summary

This paper presents research into the current grape procurement practices in the Spanish D.O. Ribera del Duero. Through in-depth interviews with wineries of the appellation, their relationships with independent grape growers were explored, focusing in particular on the current and potential role of long-term contracts. The research found that procurement practices in Ribera del Duero are much less developed than would be expected in such a prestigious region. In fact, there is a near total absence of long-term contracts. Relationships between wineries and growers appear to be dominated by lack of trust and most of the wineries interviewed fail to see the strategic relevance of the procurement process. This situation is in contrast with other leading wine regions in the world, including Rioja. The paper argues that a more strategic approach to procurement policy would positively contribute to the future commercial and financial success of wineries in Ribera del Duero. Building on a review of existing literature on grape procurement around the world, it develops a set of recommendations for wineries to improve vertical co-ordination through the use of contracts.

2. Introduction

This paper presents research into the current grape procurement practices in the D.O. Ribera del Duero in North-Central Spain. Through in-depth interviews with wineries of the appellation, it explores the relationship between grape-buying wineries and independent grape growers, focusing in particular on the current and potential role of contracts in this relationship. The paper aims to contribute to a better understanding of the supply dynamics in a commercially relevant region of Spain that is currently looking for ways to improve its position in international markets, differentiate its offerings from those of other regions and ultimately obtain better sales for its products.

Spain is the third largest wine-producing country and has the largest vineyard area in the world (OIV, 2015). However, the country ranks only seventh among wine-consuming countries and 33rd in wine consumption per capita (OEMV, 2015). Per capita consumption currently stands below 20 litres, having fallen from 59 litres in 1965 (Martínez and Medina, 2012), making Spain one of the countries in Europe with the lowest wine consumption per person. With no expectation of improvement in domestic consumption on the horizon, Spanish wine producers are currently grappling with the need to export more wine and be better positioned to compete in the international market. The country is also faced with the challenge that the business practices of many wineries have their origin in Spain's tradition as a bulk wine producer and are often not geared towards producing high-quality or fine wines. In order to be more successful financially, Spanish wineries need to increase the perceived value and average price of their exported wines, currently the lowest of all major producing countries at €1.10 per litre ex-works (OEMV, 2016).

Part of the difficulty Spain faces in changing the bulk mentality is that most wine grapes are still purchased through spot markets[1], which can pose an obstacle to creating and consistently offering higher-quality, more unique products (Fernandez-Olmos, 2008) that have the ability to convey their origin or history. As markets increasingly demand distinct, more differentiated products[2], agri-food sectors in many countries are working to improve the flow of information in the supply chain by moving towards closer vertical co-ordination from production to consumption (Gwynne, 2006). Overall, while there are beneficial aspects to open market spot transactions, there are advantages to contracts, joint ventures or strategic alliances that have the potential to foster the development of more stable and higher quality brands (Hobbs and Young, 2000) which need to be more seriously considered.

The importance and benefits of effective procurement are well documented in economic and business literature and include cost reductions, enhanced profitability, assured supplies, quality improvements and competitive advantages.[3] The higher the quality of a wine-growing region, the more likely it is to need to specify production practices that affect subtle wine attributes. In contrast, contracts for lower quality regions are more likely to specify price incentives for sugar and other easily measured characteristics that comprise the key attributes of lower quality wine (Goodhue et all, 2003).

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[1] The "spot market" is the generally accepted term for exchanges carried out without a long-term contract, with sales conditions fixed between the parties at the moment of the exchange. Spot markets offer most flexibility to both parties but also expose them to the full risks of varying availability and fluctuating market prices.

[2] The growing demand for differentiated agricultural products is well documented by many researchers including Rousset (2004), Carriquiry and Babcock (2002) and Hussain et al (2008).

[3] See for example Harrigan (1986) and Baldwin et al (1997).

Ribera del Duero offers a compelling case study in which to examine the potential of long-term grape contracts. Compared to regions such as Rioja or Castilla-La Mancha, it is relatively small, but has many ambitious producers targeting the premium and luxury market segments. In order to be able to successfully compete in these segments and to grow a sustainable level of sales (in light of increased production and decreased domestic consumption), Ribera del Duero needs to examine its methods of grape procurement.

Two legislative changes also contribute to the relevance of the topic: first, the 2010 Spanish national law regulating terms of trade and payment of fresh agricultural produce, which is being applied to wine grapes. This law makes the signing of a basic sales contract between a grower and a winery compulsory (BOE, 2010). Secondly, the liberalisation of planting rights in the European Union after the current transitional period ends in 2018, which may affect the balance between offer and demand in the market for grapes.

The paper addresses the following research questions:

I. How are vineyard ownership and grape purchases distributed among wineries in Ribera del Duero? How many wineries rely only or mostly on own vineyards and how many buy a major part of their grape needs from independent growers?

II. Looking at the group of wineries that mainly buy grapes, how is the relationship with growers governed? What part of purchases are covered by long-term contracts, as opposed to purchases on a yearly spot market? What kind of contracts are used and what do they stipulate?

III. How satisfied are wineries with their current procurement models? Is there a trend towards more use of long-term contracts? Do they believe more formal long-term contracts could help them to achieve better quality on more competitive terms? If so, how should contracts fix grape prices?

3. Research Paper Context

3.1. Ribera del Duero in the Context of the Spanish Wine Industry

Ribera del Duero is a wine region and appellation of origin (*Denominación de Origen* – D.O.) in Castilla y León, in North-Central Spain. It ranks third among Spanish appellations in terms of total value of wines sold, after Rioja and Cava (MAGRAMA, 2015).

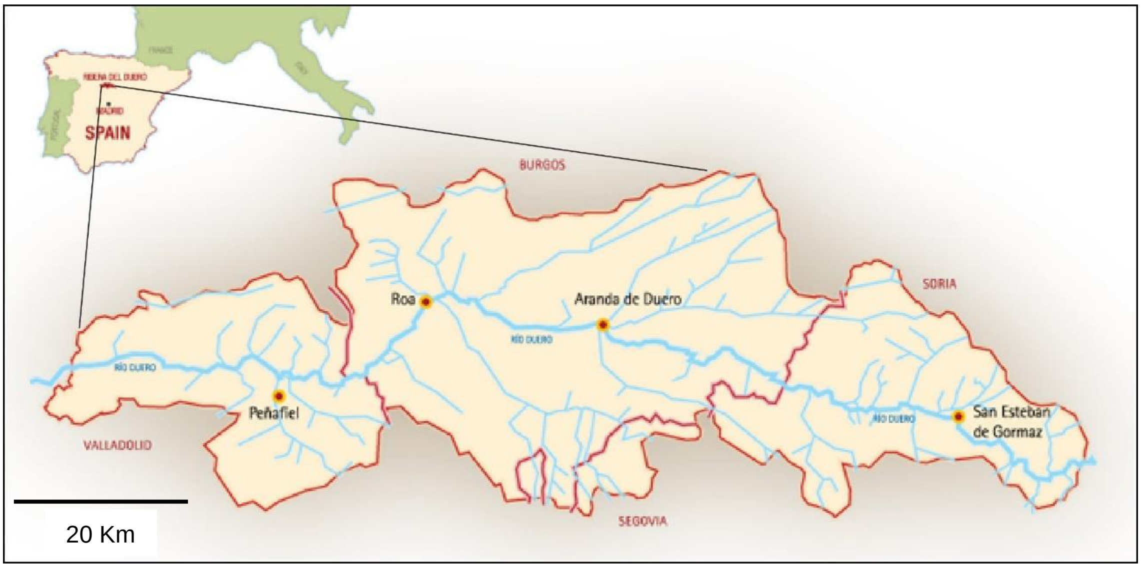


Figure 1: Map of the D.O. Ribera del Duero. Source: Consejo Regulador de la D.O. Ribera del Duero

Ribera del Duero stretches over 100 kilometres from west to east, covering vineyards in four Spanish provinces, of which Burgos is by far the most important, with over 70% of the vineyard surface. Valladolid is well-known as the location of several famous wineries, but only has 20% of the vineyard surface. Soria, to the east, covers just under 6% of the vineyard, while Segovia has less than 1%. Geology and meso-climates change considerably between provinces and sub-regions. It is common for grapes in an average Valladolid vineyard to ripen seven to ten days earlier than in Burgos. Higher vineyards in Soria tend to be harvested even later, often well into the month of November.

Established with only seven wineries in 1982, the D.O. Ribera del Duero is relatively young compared to other appellations such as Rioja (1926) or Utiel-Requena (1932). However, since its creation, the D.O. has seen a steady evolution, with the number of wineries growing from only seven to over 200 in the 20 years between 1986 and 2006. In 2015, the total number of wineries stood at 288, although only 258 processed grapes.

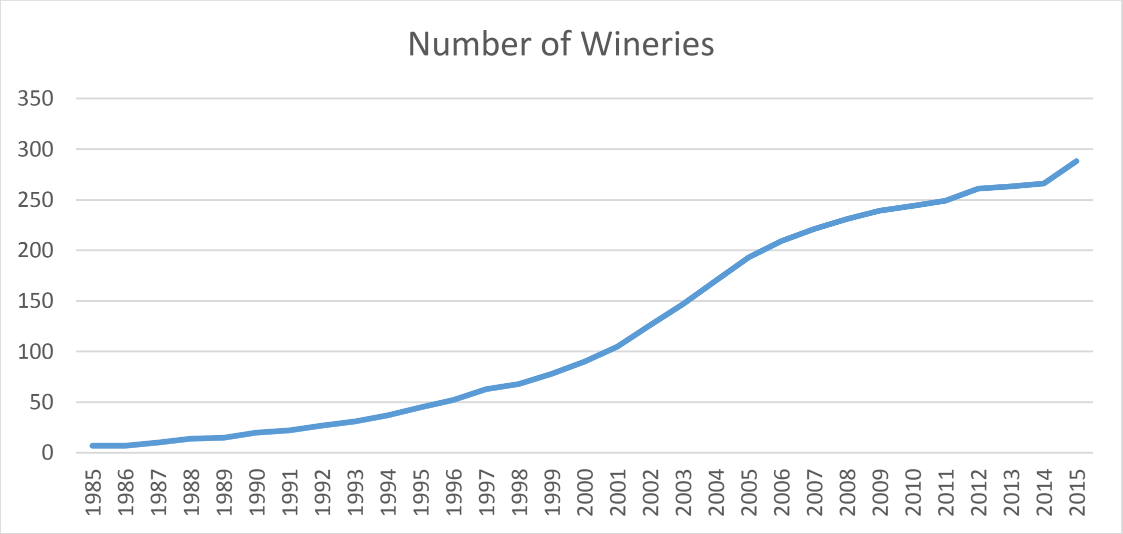


Chart 1: Wineries registered in the D.O. Ribera del Duero, 1985-2015.
Source: based on data from the Consejo Regulador de la D.O. Ribera del Duero

The tonnage of grapes and number of bottles produced have also grown significantly over the last thirty years.

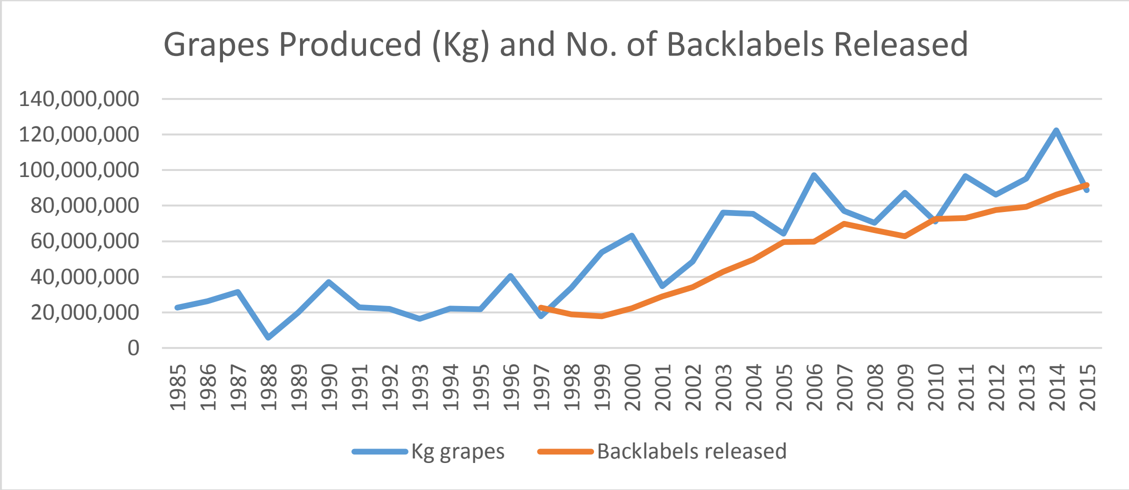
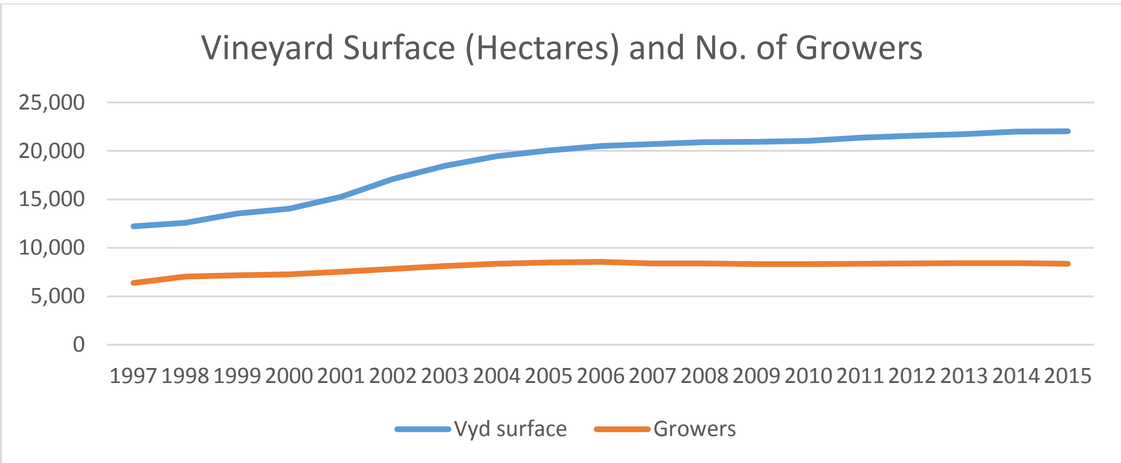


Chart 2: Grapes produced in Ribera del Duero and number of backlabels released[4], 1985-2015. Source: based on data from the Consejo Regulador de la D.O. Ribera del Duero

Vineyard surface grew from an estimated 7,000 hectares to over 20,000 between 1986 and 2006, and has continued to grow (albeit more moderately) to 22,000 hectares in 2015. The number of growers has remained relatively stable over the years at around 8,000, however, the average holding has increased from 1.6 to 2.8 hectares per grower. Despite some consolidation, the vast majority of growers are not professionals and cultivate their (often) inherited vineyards as a side job (Alonso, pers. comm; Ugarte, pers. comm).



[4] All wines bottled in the D.O. Ribera del Duero must carry an official backlabel, released by the Consejo Regulador upon request by wineries for each bottling. The Consejo publishes information on the number of backlabels it releases every year. While wineries may hold a small stock of backlabels between reception and labelling, the number of backlabels released is a reliable indicator of the total number of bottles produced and marketed each year in the appellation.

Chart 3: Evolution of surface under vineyards and number of growers registered with the Consejo Regulador, 1997-2015. Source: based on data from the Consejo Regulador de la D.O. Ribera del Duero

Compared to other major production areas in Spain, grape-growing conditions in Ribera del Duero are challenging. At between 700 and 900m above sea level and with a very continental climate, the growing season is short and frost is a commonplace hazard in spring (Robinson, 2006). According to one of the producers interviewed for this paper, "Ribera del Duero often suffers severe crop reduction because of spring frosts, hail and autumn frosts, typically in one out of three years. Growers often struggle to achieve phenolic ripeness of grapes." (García Viadero, pers. comm.).

The following graph shows the average yield in kilograms of grapes per hectare of vineyards in Ribera del Duero from 1985 to 2015, illustrating the very high variability for a Spanish wine region.

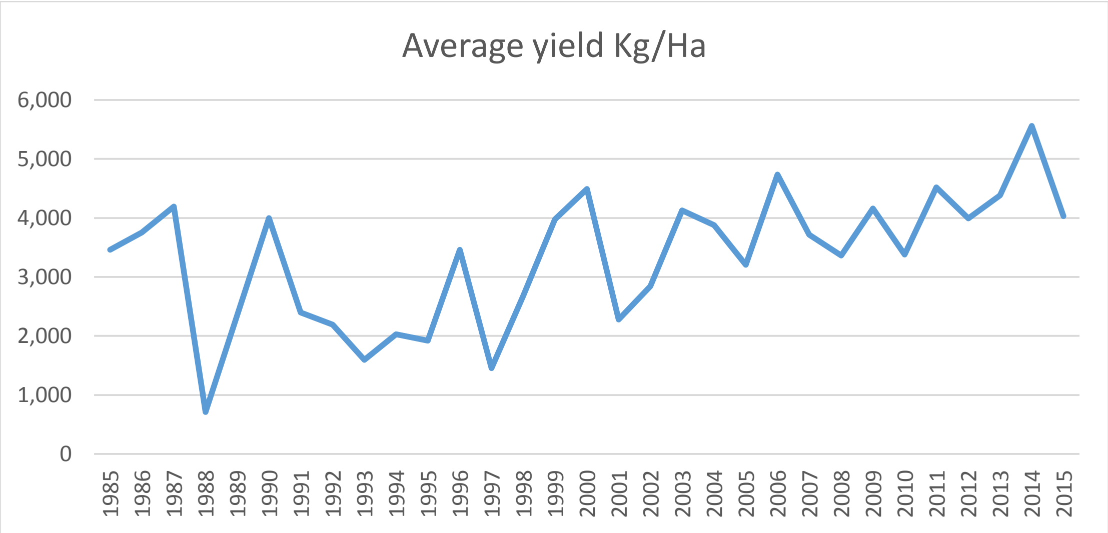


Chart 4: Average yield in Kg/Ha in Ribera del Duero, 1985-2015. Source: based on data from the Consejo Regulador de la D.O. Ribera del Duero

Although average yield is growing due to new plantings, modernized viticulture, trellising and increased use of irrigation, it remains well below the permitted maximum of 7.000 kg/ha. The average yield of the five years from 2010 to 2015 was a mere 4,300 kg/ha, for example. These average yields hide a big disparity between more productive vineyards, planted mainly in the last 20 years on more fertile ground, and extremely low-yielding, mostly dry-farmed, older vineyards.

The 2015 vintage, which was the basis of the research for this paper, was a relatively small one with under 89 million kilograms of grapes, leaving many wineries with less volume than desired. However, the 2016 vintage, still in process during the writing of this paper, is likely to be the biggest in history, in excess of 130 million kilograms of grapes. Such huge shifts in yearly grape production[5] lead to price fluctuations and supply insecurity for wineries, which in turn can hinder brand development and the building of distribution networks. In this context, it is highly likely that a long-term approach to grape procurement would be especially helpful.

The Consejo Regulador does not publish official data on export volumes[6], but it did claim that the region exported 14% of its production in 2013 (Alonso, pers. comm.). This compares to an average export quota of 46% of all Spanish D.O.s and suggests that the commercial success of Ribera del Duero has been largely limited to the domestic market.

[5] For comparison, yields in the D.O.Ca. Rioja in the vintages 2014-2016 were 7.040, 7.140 and 7.385 kg/ha respectively.

[6] Even the official report on export figures of Spanish *Denominaciones de Origen*, published every year by the Spanish Ministry of Agriculture (MAGRAMA) includes no figures for Ribera del Duero, stating that no information was received from the government of Castilla y León.

Compared to other regions, Ribera del Duero sells a higher percentage of its production in the on-trade[7]. The combination of a low presence in export markets and dependency on the domestic on-trade made Ribera del Duero especially vulnerable to the severe financial and economic crisis of 2007-2010. Although the Consejo Regulador and the local government bodies tend to be reticent to share specifics about the exact economic status of the local wine sector, the professionals interviewed for this paper were in agreement that the impact of the economic downturn was "dramatic" for Ribera del Duero. While it is beyond the scope of this paper to analyse the financial performance of the wineries in Ribera del Duero, it seems clear that many wineries of the D.O. face challenges to build economically sustainable businesses[8]. As in many other wine regions around the world, Ribera del Duero is seeing a polarization between a few small, prestigious estate producers at the top and big, highly efficient, volume-oriented bottlers at the lower end. Mid-sized wineries are squeezed between these two models and under increasing pressure to offer wines of higher perceived quality and character.

Traditionally, wineries in Ribera del Duero focused on producing oak-aged wines in the *crianza* and *reserva* categories. Since the late 2000's, the appellation has considerably increased its presence in the Spanish multiple off-trade, mainly with younger wines in the *joven* and *roble* categories (Navarro de la Cal, pers. comm). This is a consequence of the establishment in the area of three major wineries, who between them now crush about 20% of the appellation's total crop. Two of these wineries are owned by the two biggest Spanish wine companies, Felix Solís

[7] Domestic restaurants represented 56% of the volume of Ribera del Duero sold in Spain in 2012, compared to 46% of all wines with D.O. (Nielsen, 2012).

[8] Most illustrative is perhaps the claim of an investment banker specializing in wineries that "at least 50 of the 288 wineries registered in the D.O. are zombie wineries and effectively bankrupt. Perhaps 100 wineries are available for sale" (Sanchez-Guerra, pers. comm.).

Aventis and J. García Carrión respectively, while the third is the exclusive supplier of, and co-owned by, leading Spanish supermarket chain Mercadona.

Today, Ribera del Duero has a total size and diversity of vineyard sites that make it necessary for the appellation to count on a range of producers catering to multiple market segments. The research for this paper explored the relationship between grape growers and wineries in this context, specifically the degree of use of contracts and their perceived importance as a competitive factor. The procurement policies might have been expected to reflect the diversity of wineries and be adapted to the business models of companies in different market segments. Yet, as this research revealed, that is not currently the case in the region, but it should be something for wineries to consider.

3.2. Literature Review

Sourcing grapes is an organizational challenge for wineries and requires effective co-ordination between them and the supplying growers[9]. A “governance structure” for the relationship should serve three main objectives: allocating income rights, allocating decision rights and solving conflicts (Hendrikse, 2003). There is a spectrum of governance structures, from spot markets to full vertical integration, with contracting as an intermediate alternative.

This review first introduces key elements from the economics and organizational theory literature on choice of governance structure and vertical integration. Then, previous work on wine grape procurement around the world.

3.2.1. Contract Design

A contract, at its most basic level, is a legally enforceable agreement (Masten, 1998). A wide variety of agreements can and do exist in any agricultural products industry. The only thing required for a contract to exist is a commitment on the part of either party involved. There must also be some kind of cost associated with a failure to honour one’s obligation. Such a cost might be a financial penalty, or something less tangible, such as damage to one’s reputation (Wolf et al., 2001).

[9] This need for co-ordination derives from different needs, expectations and importantly, risks, grape growers, winemakers and marketers have within their operations. There are significant agricultural risks associated with farming an annual crop that is highly perishable with a very narrow window of harvest opportunity that cannot be stored, unless transformed into wine. Winemakers and marketers though also face issues of vintage variation, inventory costs, capital costs and many other manufacturing, distribution and marketing risks. In addition, there are the added marketplace challenges of fickle consumers whose preferences for brands, styles and varietals change frequently (Swann, 2002).

Beyond this basic commitment-enhancing function, contracts are generally associated with three broadly distinct (but inseparable) functions: co-operation, risk transfer/incentive alignment and transaction cost economizing (Bogetoft and Olesen, 2002)[10].

Contracts can vary significantly in style and content. They can be classified depending on their duration and complexity, ranging from simple, short-term contracts, to long-term agreements and relational contracts. In the case of informal contracts such as verbal/handshake deals, enforcement can take the form of implicit cultural conventions, reputation and repeated interaction. Even with formal (i.e. written) contracts, because of the incomplete nature of contracts[11], many features may well be left unstated and implicit between the parties.

To achieve the co-ordination benefits that contracts can potentially provide, it is necessary to design and implement the contract. The contracts typically offered by a winery reflect a trade-off between the extent that it is willing to provide "insurance" to a grower and the need to provide incentives so that the grower exerts the necessary effort to produce wine grapes of the desired quality. The issue of efficient risk-sharing depends on whether the grower is risk neutral or risk

[10] Research about vertical relationships in wine has been dominated by Transactional Cost Economics (TCE) (Allen and Lueck, 1995). TCE focuses on the main transactional factors that affect the choice of governance structure, in particular measuring costs, uncertainty and asset specificity (Masten, 1998; Williamson, 1979, 1996). The approach recognizes that economic transactions do not occur in a frictionless vacuum, but that the buyer and seller incur costs in conducting a transaction (Williamson, 2008). As the transaction costs of using the open market system rise, TCE predicts closer vertical co-ordination, i.e. more transactions carried out through contracting, under the auspices of a strategic alliance or within a vertically integrated firm (Coase, 1937; Williamson, 1979).

[11] The incomplete contract paradigm was pioneered by Hart and Moore (1988) and is a key concept in contract theory. It argues that when drawing up a contract, it is often impracticable for the parties to specify what is to be done in every possible contingency. This leads to the so-called "hold-up problem", a situation where two parties may be able to work most efficiently by co-operating but refrain from doing so because of concerns that they may give the other party increased bargaining power, and thereby reduce their own profits. The hold-up problem leads to severe economic cost and underinvestment.

averse. The literature usually assumes the grower to be more risk adverse than the winery (Fernandez-Olmos, 2008). In reality, growers may display considerable risk tolerance, especially if they do not obtain their main income from grape growing.

In an ideal world, a contract could specify exactly the actions of the grower and the winery and could provide a framework for effective risk sharing (Hueth and Ligon, 1999). In the real world, however, wine grape-growing and wine-making involves price, quantity and quality risks.

One important aspect of contract design is to reduce the cost of pre-contractual opportunism (Akerlof, 1970) and to reduce the cost of post-contractual opportunism by motivating the growers to take the right actions (Wolf et al., 2001). Hueth and Ligon (1999) identify four ways in which a winery can attempt to influence the behaviour of growers: measure quality, monitor activities, exert direct control and residual claimancy.

The contract design is complicated by a number of problems:

- A *moral hazard* occurs if a grower shirks the tasks necessary to satisfy the contract. A winery needs to design a contract that offers incentives to prevent shirking, but then does not place the grower in danger of excessive risk. In practice, this can be addressed by a flat fee (the risk-sharing component) plus various performance incentives (bonuses and penalties) for quality (Fraser, 2003).

- *Adverse selection* occurs when one party to the transaction is better informed than the other about the characteristics of what is being exchanged. The literature suggests four approaches to reducing this problem: 1. Collecting information before the contract is signed, reducing the informational advantage of the grower, 2. Use of signalling by the growers to reveal their “true type” before the contract is signed. 3. Rationing by the wineries, leading to fewer but better contracts, i.e. offering contracts that are only acceptable to “good” growers and 4. Design by the wineries of a menu of contracts which force growers to reveal their true type through their selection of contract (also called “screening”). (Rothschild and Stiglitz, 1976).

- *Downstream price risk* is another complicating factor. If a winery is risk neutral then this is not an issue for the grower and will not impact on contract design. In practice, this can be solved if the price paid for the grapes is linked to the bottle price of the wine. This practice is referred to as *residual claimancy* in the literature (Fraser, 2003).

3.2.2. Relational and “Hybrid” Contracts

Because of the complexity of real-world transactions, formal contracts are necessarily incomplete and can only be imperfect tools for controlling opportunism. The challenge is to devise a structure that encourages rent-increasing adjustments (flexibility) but discourages rent-dissipating efforts to redistribute existing surpluses (opportunism). The solution may be less precise, "relational" contracts that leave terms to future negotiation. These contracts do not attempt to stipulate responses to every possible event and are considerably easier to draft yet at the same time remain flexible in the face of changing circumstances (Crocker and Masten, 1991).

Relational exchange arrangements supported by trust are commonly viewed as substitutes for complex contracts. Many argue that formal contracts can even undermine trust and thereby encourage the opportunistic behaviour they are designed to discourage. However, Poppo and Zenger (2002) suggest an alternative perspective, showing that formal contracts and relational governance can function as complements.

There is a whole class of economic organizations that fall neither under pure market relationships nor within firm boundaries. These arrangements, identified as "hybrids", can be defined as arrangements in which two or more partners pool strategic decision rights as well as some property rights, while simultaneously keeping distinct ownership over key assets (Ménard, 2012). Hybrids have multiplied in many industries, because they are viewed as efficient in dealing with knowledge-based activities, solving hold-up problems, and reducing contractual hazards.

3.2.3. The “Make-or-Buy-Decision”

Fernandez-Olmos (2008) found that wineries in DOC Rioja are attempting to secure greater supply security by expanding their own vineyards to ensure quality requirements. However, a decision to own vineyards can lead to inefficient financing and reduce the financial returns of the company. One could argue that the fact that wineries respond to lack of supply security or quality by increasing vertical integration is a failure of the industry to design efficient contracting or hybrid governance systems.

Vertical integration, in this case the ownership of vineyards, appears to wineries to solve many *ex-ante* co-ordination problems between them and independent growers. However, internal organization creates *ex-post* problems of control and co-ordination and may lead to agency costs[12].

Mahoney (1992) studied the advantages and disadvantages of vertical financial ownership and stated that “for each motive for financial vertical integration, a contract may replicate the advantages of ownership”. While vertical financial ownership makes sense when assets are idiosyncratic and closely tied to a specific strategy, it has disadvantages that are often overlooked, suggesting that firms should examine more carefully the alternative governance structures at their disposal. Vertical financial ownership may lead to capital drain and creates bureaucratic, strategic and production costs. A vertically integrated estate winery that does not utilize a sufficient amount of the input to achieve minimum efficient

[12] Cadot (2015) found that agency costs of vertically integrated wineries may reach 2-3% of sales in the French wine industry.

scale will be at a cost disadvantage against firms that contract out to an efficient supplier achieving full economies of scale.

Harrigan (1986) analysed how successful uses of vertical integration differ from less successful ones. Ironically, many of the firms that suffered adversity after vertically integrating, possessed the bargaining power needed to contract advantageously for goods and services, but accepted an overly risky ownership position unnecessarily by producing them instead.

3.2.4. Previous Work on Winegrape Procurement

Few attempts have been made in the literature to analyse the governance of the value chain for wine, despite it having the most complex and sophisticated quality infrastructure in the agri-food sector (Ponte, 2009). Economist have expended enormous effort examining the rationale for contracts in agriculture, but few studies have been undertaken in viticulture (Fernandez-Olmos, 2008). Little is known about the extent of contract use, specific contract provisions, or the implications of different pricing methods and particular terms for the future of the industry (Pate, 2011).

However, the increasing importance of vertical co-ordination between wineries and grape growers is well documented in the economic and business literature (Goodhue et all, 2003), as well as the benefits of effective procurement. Baldwin et al. (1997) discuss these benefits in the Australian wine industry, including cost reductions, enhanced profitability, assured supplies, quality improvements and competitive advantages. Differentiation through vertical co-ordination is a key issue (Cadot, 2015) and evidence from leading production areas suggest that co-ordination contributes to higher product quality at given costs and to higher differentiation potential across the whole value chain. The management of the relationship between wineries and growers is therefore likely to be a relevant success factor for Ribera del Duero.

Zylbersztajn (2002) shows that more stable contracts are a characteristic of high quality wine production. He also concludes that contracts as part of the organizational architecture are as important as specific regional characteristics in producing quality attributes that add to the value of a brand.

Rousset (2004) shows that the adaptation of production to specific requirements leads companies to integrate viticultural activity and to make their relationship with suppliers evolve through non-standard contracts. The adoption of longer-term contracts to co-ordinate the supply of grapes is a rational response to difficulties encountered in the use of spot markets. A contract that guarantees grape supply in a timely manner introduces certainty into production, allows allocation of resources with greater confidence, and reduces the costs associated with locating grapes to be used in the production of wines of specific quality levels. The need to secure grape supply is also important in terms of maintaining wine quality and, in turn, building brand reputation. Contracts can also stabilize fluctuations in cost and prices, which can be a fundamental impediment to maintaining market presence.

Fernández-Olmos, Rosell-Martínez and Espitia-Escuer (2009) analysed the relationship between product quality and governance mode choice, using the results of a survey of 187 Rioja wineries. They concluded that wineries that produce high-quality wines are more likely to vertically integrate than are wineries that produce low-quality wines. Consistent with Transaction Cost Economics, evidence is found that asset specificity and uncertainty are important determinants of vertical integration.

Goodhue *et al.* surveyed wine grape growers in California in 1999, finding that more than 90 percent sell grapes to wineries under contract and that most of the contracts are written. Following that work, Goodhue *et al.* (2003) specifically examined the pattern of wine grape supply contract use, specific production practice provisions and bonus/penalty price incentives. Their analysis of the choice among spot markets, oral contracts, and formal written contracts suggests that more formal co-ordination is associated with higher product quality and that contracts are increasingly frequent. Further, learning and trust that develop over time do not appear to substitute for formal written contracts.

Fraser (2003) reviews the technical issues that underpin the design and implementation of contracts. He finds that in Australia, in 2000, between 77 and 81 percent of grapes were sourced from non-winery-owned vineyards. He also stresses the complexity of measuring grape quality, affected by viticultural practices and environmental effects[13]. In 2005, Fraser further examines the various means by which a winery might influence the behaviour of a grower. It finds that lower quality grape-growing regions place a greater reliance on grape quality assessment to determine bonus/penalty payments compared to higher quality regions, which place greater emphasis on explicit winery involvement in vineyard management.

Fernández-Olmos (2008) analyses contractual structures in different viticultural regions, finding that contracts are an effective way for wineries to articulate their grape quality requirements and to define production responsibilities between growers and wineries. It also notes that while contracts facilitate the relationship, they do not guarantee long-term success, discussing the role of trust and reputation. The paper compares percentages of contract use from Fraser (2003)

[13] There are many viticultural parameters that can be measured (e.g. crop load, fruit exposure, berry size, leaf area/fruit ratio, etc.) but achieving particular parameter measures does not guarantee fruit quality.

and Goodhue *et al.* (2002). Her own research finds that approximately 42% of wineries in the DOC Rioja used contracts in 2008.[14]

Franken (2014) investigates factors influencing co-ordination of the California grape and wine supply chain. Results confirm that quality considerations significantly increase the use of more formal co-ordination mechanisms.

Swann (2002) compares various forms of contracts between growers and winemakers around the world. It finds huge differences between the New and Old World, as a result of tradition and socio-economic factors. Australia and the US have the most formal contracting systems, with most grapes supplied under written contracts. It also suggests that as the industry becomes more global, "trusting and honourable verbal agreements" are no longer a solution. Recognizing the difficulties of enforcing strict legal contracts, it suggests intermediate solutions, like per-hectare and leasing contracts.

[14] This was before the 2010 law that made the formalization of simple contracts compulsory in Spain (BOE, 2010). Anecdotal evidence collected by the author for this paper suggests that the use of contracts has increased further in Rioja since 2008 (Soler, pers. comm., Mato, pers. comm.)

4. Research Methodology and Sampling Strategy

4.1. Choice of Research Method

This paper focuses on these issues from the perspective of the wineries as, in most cases, it is the winery that decides on the governance structure. Wineries tend to be much bigger enterprises than growers and generally are in a stronger bargaining position. The approach also allows for a greater understanding of the differentiation of governance structures based on quality requirements and provides a larger picture of the supply chain, taking into account plural procurement.

A qualitative data collection approach was chosen to meet the objectives of this paper. The main body of research consists of 43 semi-structured, face-to-face interviews with wineries, conducted by the author between November of 2015 and October of 2016. All interviews were held with a member of senior management directly responsible for grape procurement: the technical or buying director, the head winemaker, managing director or owner. These interviews varied in length between 45 and 75 minutes, in order to provide accurate and rich information and allow a good understanding of the complex issues investigated.

The qualitative approach was also chosen because of the potential difficulties in sending online or paper questionnaires to, and especially in obtaining responses from, winery operations that are mostly small or medium-sized family businesses. Purchasing policy is considered sensitive information by most wineries. The personal interviews allowed for the author to build a personal rapport with the interviewees, give reassurance about confidentiality and contrast the validity of the information received, based on the author's own experience in the industry.

In the early stages of the research it became evident that the initial method foreseen to answer research question I – reviewing websites and publicly available information to sort wineries by their level of vineyard ownership - would not lead to satisfying results. First, there is no reliable information publicly available. While the Consejo Regulador keeps track of all grape deliveries from growers to wineries, it has no information on the ownership or contractual relationship between the parties. Second, many wineries feel that customers and the public in general are prejudiced against wineries that purchase grapes, leading them to exaggerate the amount of vineyards owned by the company or not to wish to communicate about their degree of vertical integration. It was therefore decided not to rely on the commercial information available, but to use only data obtained from the personal interviews.

A sample of 12 grape growers was additionally interviewed to obtain their perspective. Complementary interviews were held with industry experts, investment bankers involved in the wine business, members of the Consejo Regulador of the D.O. Ribera del Duero, the Spanish Wine Federation (FEV), the Observatorio Español de los Mercados del Vino (OEMV) and the winery association ASEBOR.

4.2. Sampling Strategy

In the 2015 harvest, a total of 258 wineries crushed grapes in the D.O. Ribera del Duero. These wineries were considered the sampling universe for this paper. Using data from the Consejo Regulador, these wineries were segmented into six strata, according to their crush volume. The total crush volume of all wineries in each stratum was added, in order to determine the approximate percentage that each stratum represents of the total 2015 harvest:

Stratum	Crush volume	No. of wineries	% of total wineries	Approx. total crush	% of total crush
A	0-50,000 Kg	69	27%	2M Kg	2%
B	50,001-150,000 Kg	70	27%	6M Kg	7%
C	150,001-500,000 Kg	74	29%	21M Kg	24%
D	500,001-1,000,000 Kg	29	11%	19M Kg	21%
E	1,000,001-3,000,000 Kg	13	5%	24M Kg	27%
F	more than 3,000,000 Kg	3	1%	17M Kg	19%
TOTAL		**258**	**100%**	**89M Kg**	**100%**

Table 1: Segmentation of Ribera del Duero wineries in strata according to their grape crush volume in the 2015 harvest. Source: prepared from data of the Consejo Regulador de la D.O. Ribera del Duero

In total, 43 wineries were interviewed, representing 52% of the total of grapes processed and 16.7% of the wineries that crushed grapes in 2015.

During the early stages of the research, it became evident that few (only three out of twelve) of the wineries in the two smallest strata A and B purchased grapes from independent growers, while all of the wineries in the biggest stratum F and most in the second biggest stratum E relied mainly on purchased grapes. The sampling strategy was therefore adapted to include proportionally higher percentages of wineries in the bigger strata, to cover the highest percentage possible of purchased grapes, while still obtaining a representative view of all wineries.

Table 2 shows the number of wineries interviewed in each stratum and the percentage they represent of the total crush of their strata.

Stratum	Crush volume	No. of interviews	% of wineries	Total crush kg	% of crush
A	0-50,000 Kg	5	7,2%	0.19M	9%
B	50,001-150,000 Kg	7	10,0%	0.73M	12%
C	150,001-500,000 Kg	9	12,2%	2.86M	14%
D	500,001-1,000,000 Kg	9	31,0%	6.81M	36%
E	1,000,001-3,000,000 Kg	10	76,9%	18.40M	77%
F	more than 3,000,000 Kg	3	100,0%	17.00M	100%
TOTAL		**43**	**16.6%**	**45.99M**	**52%**

Table 2: Wineries interviewed by stratum and percentage represented of total grapes crushed in the appellation in 2015.

5. Research Results and Analysis

5.1. Research Question I

Interviewees were asked how many grapes they had crushed in 2015 and what percentages came from independent growers versus from own vineyards (questions 1 to 6 of the questionnaire). “Own vineyards” was defined as vineyards in which a controlling stake was held either by the winery itself or by relevant shareholders of the winery, directly or indirectly via holding or associated companies. Table 3 shows the results obtained. The main findings can be summarized as follows:

- The sum of tons of grapes declared by all wineries to come from independent growers represents 59% of the total crush of the sample. When co-operatives are excluded, this figure increases to 68%. This supports the estimate given by the Consejo and other experts during their interviews that around 70% of the grapes processed in the appellation are purchased from independent growers.
- Eighteen of the 43 wineries (42%) interviewed declared themselves to be purely estate operations, not buying any grapes. The four co-operatives in the sample only crush grapes from their members and were therefore included among “estate operations”.

Stratum	Winery no.	Total kg crushed	% purchased	% own vineyards	Kg purchased
F	1	7.000.000	99	1	6.930.000
	2	5.000.000	96	4	4.800.000
	3	5.000.000	55	45	2.750.000
E	4	3.000.000	100	0	3.000.000
	5	2.600.000	80	20	2.080.000
	6	2.200.000	99,5	0,5	2.189.000
	7*	1.800.000	0	100	0
	8	1.800.000	55	45	990.000
	9	1.700.000	72	28	1.224.000
	10*	1.600.000	0	100	0
	11*	1.300.000	0	100	0
	12*	1.200.000	0	100	0
	13	1.200.000	0	100	0
D	14	980.000	0	100	0
	15	930.000	97	3	902.100
	16	800.000	0	100	0
	17	800.000	0	100	0
	18	800.000	30	70	240.000
	19	700.000	40	60	280.000
	20	600.000	20	80	120.000
	21	600.000	30	70	180.000
	22	600.000	20	80	120.000
C	23	500.000	10	90	50.000
	24	400.000	75	25	300.000
	25	380.000	0	100	0
	26	300.000	30	70	90.000
	27	300.000	60	40	180.000
	28	300.000	100	0	300.000
	29	240.000	0	100	0
	30	240.000	35	65	84.000
	31	200.000	50	50	100.000
B	32	150.000	67	33	100.500
	33	137.000	30	70	41.100
	34	125.000	20	80	25.000
	35	120.000	0	100	0
	36	82.000	0	100	0
	37	60.000	0	100	0
	38	60.000	100	0	60.000
A	39	50.000	0	100	0
	40	40.000	0	100	0
	41	40.000	0	100	0
	42	30.000	0	100	0
	43	25.000	0	100	0
Total		**45.989.000**	**59**	**41**	**27.135.700**

Table 3: Wineries interviewed by declared crush volume in 2015 in descending order and percentage of grapes purchased from independent growers versus sourced from own vineyards. (*co-operatives)

- Twenty-eight wineries (65%) stated that they rely mostly on their own vineyards, buying less than 50% of their crush. Because the sample is slanted towards bigger wineries, this figure slightly underestimates the percentage of wineries that rely mostly on own vineyards. Assuming that the results from wineries interviewed are representative of their whole stratum, it can be estimated that about 70% of the wineries in Ribera del Duero crush mainly grapes from own vineyards.

The sample showed the following pattern of distribution of grape purchases:

Stratum	Total crush (kg)	Purchased (kg)	%
A	185.000	0	0
B	734.000	226.600	31
C	2.860.000	1.104.000	39
D	6.810.000	1.842.100	27
E	18.400.000	9.483.000	52
F	17.000.000	14.480.000	85

Table 4: Percentage of grapes purchased in 2015 from independent growers by stratum (including co-operatives)

The third-biggest producer in stratum F (and in the appellation) is a former co-operative, converted to a private company, obtaining 45% of its grape needs from vineyards owned by former co-operative members who are now shareholders. The second biggest stratum E includes four co-operatives that crush only grapes produced by their members and sell the majority of their production to other wineries, either as wine or as grapes. By excluding these five players from the analysis, the following distribution of grape purchases by privately owned companies in the sample is obtained:

Stratum	Total crush (Kg)	Purchased (Kg)	%
A	185.000	0	0
B	734.000	226.600	31
C	2.860.000	1.104.000	39
D	6.810.000	1.842.100	27
E	12.500.000	9.483.000	76
F	12.000.000	11.730.000	98

Table 5: Percentage of grapes purchased in 2015 from independent growers by stratum, excluding co-operatives and former co-operative Protos

The following conclusions can be drawn:

- All very small wineries, stratum A of the sample, processed only grapes from own vineyards. These are pure estate wineries, either established by growers who built their own winery or companies created as domains from the outset.
- At the other end of the spectrum by size, the two biggest wineries of the appellation, as well as the fourth biggest, purchase nearly all (more than 95%) of their grape needs from independent growers. These companies only own a few vineyards for image or research reasons and see themselves as pure winemaking, bottling and marketing operations. If the co-operatives are excluded from the analysis, the eight biggest wineries interviewed for this paper (strata E and F) crush over 24M Kg of grapes, nearly one third of the appellation and purchase 87% of this amount from independent growers.
- For the strata with middle-sized wineries (B, C and D), the picture is complex and a wide range of combinations between own and purchased grapes occur.

5.2. Research Question II

Interviewees of purchasing wineries were asked how the relationship with growers was governed (questions 7-23 of the questionnaire).

Contrary to what the literature would suggest to be likely in a high-quality area like Ribera del Duero, the research found a near absence of long-term contracts for grape purchasing. Among the 43 interviews, only three had some sort of written, multi-annual grape purchasing contracts. The other 40 wineries declared that they had never signed a written contract with grape growers before the 2010 law that made the formalization of purchases compulsory. Since this law came into effect in 2012, all wineries are required to sign minimal standard contracts to comply with it. These agreements typically only stipulate who the contracting parties are, the quantity of grapes exchanged and a price per kilogram. Sometimes not even a price is defined; there is merely a reference to an official price published by the winery. The aim of the law was to protect small producers of fresh agricultural produce from abusive behaviour by big buyers. The law is being applied to grapes for winemaking, but with the limited effect of requiring a written documentation of each transaction. It has had no effect on the adoption of longer-term contracts or closer co-ordination between wineries and growers, with the possible exception of establishing the habit between the parties to sit down and sign a paper. A few of the interviewed wineries expressed the hope of being able to build a more specific and possibly longer-term contract on the basis of this habit.

Beyond these minimal contracts, the relationships are governed by verbal agreements for the current year, complemented by a certain degree of longer-term relational management. The verbal agreements represent only a declaration of intent, not a commitment, and therefore do not qualify as contracts. Although nearly all wineries declared to have long-term relationships with growers and the expectation of continued business with them, they have not formalized the relationship or entered commitments beyond the upcoming harvest.

The focus of negotiations tends to be solely on the price per kilogram of grapes. Among the wineries interviewed, no instances of price per hectare have been found and barely any examples of more complex price defining formulae. Prices are usually negotiated late, between June and September, depending on how the volume and quality of the harvest are judged. Wineries communicate the price they are prepared to pay and then wait for growers to decide on how much fruit they will deliver. By fixing a lower or higher price, wineries signal to the market what level of quality they expect. However, the interviewed wineries do not usually offer different prices to different growers or for different qualities of grapes.

Any other issues agreed on verbally depend mainly on the market segment in which the wineries operate. Big volume wineries in strata F and E mostly produce a commodity wine. These wineries face downstream price risk, as the retail price varies and contracts with big retailers are renegotiated on a yearly basis. The relationships between these wineries and the growers are simple and price-led. None of these wineries monitor any viticultural practices, although two are working on a set of recommendations. Quality levels are decided upon reception of the grapes by analytical means. Some provisions are made to penalize extremely low alcohol degrees, insufficient sanitary conditions and presence of material other than grapes, but no instance of a price bonus for higher quality grapes was found.

Most of the well-known, upmarket producers of fine wine are to be found in strata C and D. The wineries interviewed in this segment complement their own production by purchasing between 10 and 30 percent of their grape needs. Although often keeping the image of pure estate operations, these producers declared it crucial to have access to a wide range of vineyards across the appellation. The motivation stated is to maximize the quality of their wines, less so to reflect the personality of given vineyards. In this segment, two instances of vineyard leasing contracts were found, but the possibility was not even considered by most wineries. No instances of per-hectare contracts were found. These players define a high price per kilogram of grapes from the outset, normally in early summer, varying in recent years between €1.75 and €3.00. Four out of six wineries in this segment have dedicated teams who monitor the vineyards of a pool of historic growers and impose some viticultural practices and yield limitations. One of the best known wineries declared to pre-select up to twice as many vineyards as they expect to need, discarding a percentage along the way. This leaves a sizeable percentage of growers in the need to look for a buyer at the last minute. Three of the interviewed growers supply grapes to the most famous wineries. They see the selection process as "a bit of a lottery", but participate with a percentage of their holdings, to see if they "get lucky". They also seemed proud to supply the prestigious wineries, who can take advantage of a certain "halo effect", influencing viticultural practices to their liking without assuming a commitment (Calvo, pers.comm.; Zaccagnini, pers.comm.; Lázaro, pers.comm.)[15].

[15] This "halo effect" is consistent with the findings of Ponte (2009): lead firms can control value chains through "hands-off mechanisms" and "normative work" by providing specifications to their immediate suppliers and spreading specific quality conventions and operational procedures of their liking.

Another group of wineries in the intermediate strata are producers of mid-market, branded wines, who purchase between 30 and 70% of their grape needs. Arguably, these wineries need to produce higher quality wines than their bigger competitors, with whom they cannot compete in scale, while achieving lower grape costs than the fine wine producers. While these players declared to pay slightly higher grape prices than the biggest wineries (€0.90-1.50 per kilogram in recent years), the research found no systematic effort to secure their grape supply or to increase or at least differentiate the quality of the grapes purchased. Barely any strategic analysis was reported prior to deciding the level of vertical integration. Grape procurement is seen as a simple choice between spot market purchases and financial ownership of vineyards. Managers and buyers of these mid-sized wineries seem oblivious to the many alternatives that exist in between. Most interviewees seemed genuinely surprised when the degree of use of long-term contracts and hybrid governance systems in other wine regions or agri-food sectors were mentioned to them.

It was expected to find that these middle-tier wineries would differentiate prices offered to growers depending on quality, but most offer the same price to all suppliers. The only exceptions found were a supplement paid by some wineries for grapes from low-yielding, old vines.

The relationship between co-operatives and their growers was not found to be much different. All co-operatives declared to be working on ways to pay grapes by quality, but none had implemented any bonus scheme yet, besides penalizations for low alcohol degree or sanitary problems of the grapes. The former co-operative Protos limits the maximum yield admissible by grower, heavily reducing the price paid for productions in excess of 5.000 kilograms per hectare (Villar, pers. comm). One could argue that those grape suppliers who are also shareholders may be compensated via potential profit and dividend payments – effectively the closest thing to residual claimancy found in the appellation. Protos currently aims to produce a wider range of higher added-value wines, improving the overall product mix, but even this company is only starting to recommend viticultural practices to its suppliers, beyond the limitation of yield.

Two of the three longer-term contracts found are simple agreements between co-operatives and big wineries for inexpensive grapes, stipulating the obligation to sell and buy a volume of grapes at a fixed price per kg, over a three-year-period. The declared motivation for the co-operatives is to guarantee a minimum income and a market for their lowest-quality grapes. For the wineries, the contracts are hedges against sudden price rises in view of long-term commitments to deliver inexpensive Ribera del Duero to Spanish supermarket chains.

The only other instance of a three-year contract was between a mid-sized winery and a small group of historic suppliers. The contract stipulates the obligation to buy and sell grapes from specific vineyards, but leaves the price open to be negotiated each year. The winery hopes to move towards a more complete contract and include a longer-term price stability formula, but has not yet been able to do so. Interestingly, the winemaker responsible for the negotiation claimed to face as much internal resistance from the management of her company, a significant Spanish winery group, as from the growers. This is possibly part of the "cultural resistance" and focus on the short-term is not a problem exclusive to the growers. The goal is to buy grapes as cheaply as possible, as opposed to sourcing the best possible grapes at a given cost. There is a lack of understanding in these companies about the link between wine quality and grape procurement.

5.3. Research Question III

Questions 24 to 30 of the questionnaire addressed the level of satisfaction of wineries with their current procurement systems and their perceived prospects for the use of longer-term contracts.

In general, both wineries and growers were found to focus on the short, rather than the long, term. Relationships are marked by a considerable level of distrust and all parties seem to be hedging their bets, reluctant to commit themselves to long-term contracts in case they miss a “better deal” (Arévalo, pers.comm.; Pérez, pers.comm; Nieto, pers. comm.).

Among the six wineries interviewed that can be considered to be in the top quality and price segment of the appellation, five declared themselves to be satisfied with their procurement model. By paying much higher prices than the average winery, they are usually able to obtain grapes in the intended quality without the need to assume any of the agricultural or price risk.

However, there is a group of new competitors entering this market segment, often created by former winemakers or managers of leading wineries. These companies start with none or very few own vineyards, but with more positive relationships with growers. These seem to be the players most likely to explore longer-term and hybrid contracting formulas over the next years, as well as leases and per-hectare contracts.

The four highest volume wineries interviewed were less satisfied, complaining without exception about the lack of stability in their supply and the variability in pricing. While these wineries are not able to assume long-term price risk, they do enjoy strong links with big retailers. This would allow them to make longer term volume commitments as long as the price remains flexible. It is likely that these wineries will develop more such agreements in the future, in particular with big growers and co-operatives. More sophisticated systems to measure grape quality and to pay for them accordingly are also likely to be developed, but generally these players are expected to continue to focus on operational excellence in winemaking and distribution, without exerting much direct control over viticulture. This segment of wineries is the only one that has shown an understanding of the need to align the degree of vertical integration (zero, in their case) with the business model of the winery.

The mid-sized wineries producing mid-market wines are the group least satisfied with their procurement systems. Out of the ten wineries of that size, eight complained about the “lack of professionalism” of growers. Five out of ten declared their desire to increase their vineyard holdings in the future, despite the known financial difficulties of some of the most vertically integrated wineries in this segment. The reasons given for wanting to increase own vineyards were “security of supply” and “quality”, yet none of these wineries reported to have analysed the possibilities of longer-term contracts, joint ventures, leases or at least paying per hectare to align their interests with those of the growers.

Mid-market producers have most to gain from longer-term supplier relationships, because of their higher reliance on purchased grapes combined with the need to differentiate their offer from higher volume competitors. However, the wineries in this segment interviewed were the ones found to have less sophisticated purchasing systems. Ironically, the best of these wineries also tend to enjoy brands of a certain reputation within Spain and to sell a high percentage in the domestic on-trade. They are therefore less exposed to downstream price risk and should be in a better position to assume part of the price variation risk for grapes in exchange for more control, higher quality and more supply stability.

It was expected that wineries would aim to produce the highest quality grapes in their own vineyards and use purchased grapes for less expensive product ranges, but not even that was found to be true. Demonstrating how vertical integration can create overlooked costs, in three instances winemakers reported difficulties in producing grapes of the desired quality from their own vineyards, due to a lack of co-ordination between grape growing and winemaking in their own companies. There seems to be a general lack of a strategically coherent management of business functions in these companies, with viticulture, winemaking and sales not co-ordinated enough and being expected by top management to maximize their objectives in isolation.

The most striking example found was that of a winery owning several hundred hectares of vineyards, where the winemaker – who had not been responsible for the plantings – declared that the grapes produced from their own vineyards were generally of insufficient quality to be used in their brands. This winery sells off grapes from its own vineyards and instead purchases higher quality grapes from independent growers, while keeping the commercial illusion of an estate operation. This winery manages to have the worst of all worlds – capital tied up in its own vineyards, insufficient use of its assets and little control over the viticulture for the grapes it purchases.

Of the fourteen grape purchasing wineries interviewed in the bigger and mid-sized strata F, E and D, twelve declared that long-term contracts would be desirable and contribute to their success. However, none expected to implement any in the near future, mainly because of the fear that growers would be unwilling to commit to the long-term or respect such contracts. Several buyers of groups with wineries all over Spain stated that “the growers of Ribera del Duero are less professionalized and more focused on the short-term gain than those of Rioja, Cataluña or Castilla-La Mancha”. While this is a gross generalization and certainly unfair, two of the twelve growers interviewed by the author as a straw poll did indeed proudly declare to have broken agreements with wineries in the past, in order to obtain a better, short-term deal. It seems to be true that a certain cavalier attitude exists among some growers, especially non-professional ones with a higher tolerance for risk, because grape-growing is not their main source of income. In such a cultural atmosphere, reputation does not work as an incentive for longer-term contracts.

At the same time, four of the twelve growers interviewed showed a very open attitude to considering alternative and longer-term contracts. The most professional growers are often already managing vineyards in addition to their own, under lease contracts. As a new generation of younger and more professional grape growers takes over and some consolidation of vineyards continues in Ribera del Duero, more sophisticated contracts should become more likely.

5. Framework for Contract Type Choice

Having seen how little developed grape contracting still is in Ribera del Duero, this section builds on the existing theory and sets out a framework that could be used by wineries to devise a more effective grape procurement system.

In order to decide on an appropriate contracting strategy, wineries need to match their governance system with the most advantageous contract type for each supplier and plot, depending on relative bargaining power, the acceptable financial return and their level of tolerance for the different kinds of risk involved. Pate (2011) analyses three different contract types: per-kilogram, per-hectare and return-sharing. Depending on market conditions and contract type, the wineries or the growers may be beneficiaries or losers. Under a per-kilogram contract, the grower bears both the production yield and the vineyard input price risks. The winery bears the wine sales price risks. Under a per-hectare model, the grower is protected from the downside risk in a poor year, but does not gain in the event yields are higher than anticipated. Under a return-sharing contract, both parties share the ups and downs of the market simultaneously. Depending on the yield and quality variations of a specific vineyard, Pate recommends a different contract type. Where yield and quality are in high variance, the per-kilogram contract is likely to be preferred. Where yield variance is low but quality variance high, the per-hectare is superior. In vineyards with low yield variance where the aim is high quality, return-sharing contracts are a viable option.

Table 6 displays how specific risks faced by both parties shift in different types of contracts:

Risk Type	Contract Type		
	Per-kilogram	**Per-hectare**	**Return-sharing**
Vineyard Input Price Risk	Grower	Grower	Grower
Grape Price Risk	Winery	Grower	Shared
Wine Retail Price Risk	Winery	Winery	Shared
Production Yield Risk	Grower	Shared	Grower
Production Quality Risk	Grower	Winery	Grower

Table 6: Risk responsibility of each party under varying contract types. Source: adapted from Pate (2011)

The assessment of the variabilities of a particular vineyard or grower can be combined with the risk profile of the winery. Depending on the quality range of wines produced, wineries obtain higher or lower prices for them. Consumers apply different verification mechanisms to assess the quality of the wines in different market segments. Basic wines are bought mainly on price and promotion. For mid-range wines, geographic origin, brand and third-party endorsement become more important. In the top segments, elements like terroir and the personality of the wines come into play. Downstream price risk faced by a producer decreases as one moves up the quality ranges and higher quality verification mechanisms are used by the consumer.

Tables 7 and 8 were designed by the author based on Ménard (2012) and Ponte (2009). Table 7 presents a simplified segmentation of the market and table 8 links governance systems for the different combinations of quality range and verification mechanism of this quality by the consumer:

Market Segment	Price	Verification Mechanism for Quality Perception	Downstream Price Risk
TOP	HIGH	Terroir Personality	LOW
		Endorsement	
		Brand	
MID-RANGE		Geographic Origin	
BASIC	LOW	Promotion Price	HIGH

Table 7: Market segmentation and downstream price risk

Market Segment	Favoured Supply System	Influence Mechanism	Governance
TOP	Own Vineyards	Exert Direct Control	Hierarchy
	Lease		
	Bought-In Grapes (Hands-on)	Residual Claimancy	Hybrids
MID-RANGE	Bought-in Grapes (Hands-off)		Incentive Contracts (Longer-term)
		Monitor Activities	
	Ready-made Wine (Hands-on)		Contracts (Shorter-term)
		Measure Quality	
BASIC	Ready-made Wine (Hands-off)		Spot

Table 8: Supply and governance systems by market segment

The framework suggests initial recommendations to wineries in different market segments:

- For producers of fine wines in the top segment, vineyard ownership can be the best governance system, if the personality and quality of these vineyards are translated into the wine and communicated. Hybrid contracting forms such as leases which allow direct control of viticulture can be as valid as vineyard ownership, while giving financial advantages. Return-sharing contracts can be designed, in which the winery shares downstream price revenues in exchange for higher quality grapes and certainty, especially for players with less access to own vineyards.
- For producers of mid-range wines, the design of the procurement system is a strategic success factor. A differentiated approach by product range, offering a menu of contracting options to growers, can be used to maximize quality of grapes, by obtaining viticultural decision rights, while optimizing the use of financial and production assets. A wide range of price-fixing formulae can be used, including prices per kilogram with incentives for measured grape quality and for production practices. In vineyards with lower production yield risk and for products with lower retail price risk, the use of per-hectare contracts is recommended.
- Producers of more basic wines need to minimize their costs and keep flexibility in case of market price fluctuations. Focus should be on measuring quality and using flexible contracts for higher quality grapes.

Prices should be set per kilogram, linked to the market, with a bonus system to differentiate between qualities, measured at reception.

6. Conclusions

Numerous approaches for organizing and managing the supply chain for wine grapes are employed, ranging from simple oral agreements to formal written contracts to common ownership and management of neighbouring stages in the supply chain. Such vertical co-ordination decisions are considerations for organizational economics. The literature reviewed in this paper applies this framework to explain decisions to grow or buy grapes (Fernandez-Olmos et al., 2009) and contract grapes or trade them on the spot market (Fraser, 2005; Goodhue et al., 2003; Franken, 2014). This body of work corroborates that quality considerations significantly increase the usage of more formal co-ordination mechanisms, such as formal contracts.

Literature documents how the adoption of contracts to co-ordinate the supply of grapes to make wine is a rational response to difficulties encountered in the use of spot markets. A contract that guarantees grape supply in a timely manner introduces certainty into production, allows allocation of resources with greater confidence, and reduces the costs associated with locating grapes to be used in the production of wines of specific quality levels. The need to secure grape supply is also important in terms of maintaining wine quality and, in turn, building brand reputation. Contracts can also stabilize fluctuations in cost and prices, which can be a fundamental impediment to maintain market presence. To quote one of the interviewees for this paper: “a contract is a means to align the interests and co-ordinate the efforts of growers and winemakers. If each tries to maximize their individual interest without co-ordination, either quality or costs are compromised at the interface between viticulture and winemaking. This gets more and more important as one moves up the quality ladder." (Laso, pers. comm).

The research for this paper found current procurement practices in Ribera del Duero to be little developed, resulting in a lack of vertical co-ordination. The relationship between the interviewed wineries and their growers was reported to lack the necessary levels of trust, leading to short-term, opportunistic behaviour. Barely any use of long-term contracts was reported and most agreements are still verbal, with the exception of the compulsory written contracts, whose scope only encompasses minor legal points. This lack of confidence and opportunistic behaviour restricts the decisions that favour wine quality: a grower is not sure that a winery will pay a higher price compared to the spot market. The winery hesitates to develop marketing investments, in fear of being deprived of the grapes, bought by another winery at a higher price.

This state of affairs can be described as a classic hold-up problem, where wineries and growers in Ribera del Duero may be able to work most efficiently by co-operating but refrain from doing so because of concerns that they may give the other party increased bargaining power, and thereby reduce their own profits. Besides tradition and the relative youth of the appellation, the situation is also explained by lack of awareness among wineries and growers of the potential advantages offered to them by a more sophisticated approach to procurement and the use of non-standard, longer-term contracts, as well as hybrid co-ordination mechanisms.

Based on the theoretical framework developed and the gap found between procurement practices of the wineries interviewed for this paper and the practices in other quality regions as reported in the literature, the following practical recommendations can be made to wineries in Ribera del Duero:

- Recognize the importance of procurement management and include it in formal business planning.
- For wineries aiming at optimizing their financial efficiency, undertake systematic “make-or-buy” analyses, in order to take sound strategic decisions on the appropriate level of vertical integration.
- For wineries aiming to develop more differentiated products, use more complex forms of vertical co-ordination, regulated through consumer-driven quality conventions. Understand the many possibilities offered by hybrid governance systems as a tool to produce terroir-driven wines from specific vineyards, but without full financial ownership of them.
- Develop the per-hectare contract as a way to maximize the quality from given vineyards, by neutralizing the grower’s trade-off between yield and quality.
- Explore more sophisticated incentive contracts as a tool to better delineate grape quality. Longer-term contracts with volume commitments and flexible pricing arrangements could achieve more stable supply, especially for big, volume-oriented wineries.
- Understand the complementary character of formal contracts and relational management and how both reinforce each other. Intelligent contracts introduced on top of already existing, long-term relations may often be the best possible governance system.

Implementing the recommendations above would help to facilitate and advance co-ordination between wineries and growers in Ribera del Duero. In view of the challenges faced by the appellation, this change could play an important role in the region’s future success. Breaking old habits and overcoming the existing lack of trust is likely to require time and good-will from both sides, but the potential benefits well justify the effort.

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8. Appendices

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Appendix A: Research Paper Proposal

Research Paper Proposal Submission Form			
Student ID	**14785**	**Submission Date**	

THE INSTITUTE OF MASTERS of WINE

Name of Advisor:	Angela Muir MW
Proposed Title:	The use of long-term contracts in grape procurement – a study of current practices in the D.O. Ribera del Duero
Research Questions Define the subject of your Research Paper and specify the specific research questions you plan to pursue: (no more than 200 words)	This research paper aims to study the contractual relationship between grape growers and grape buyers (wineries) in the D.O. Ribera del Duero (RD). The RP will first investigate current grape procurement practices. Secondly, it will aim to determine the level of satisfaction with current procurement practices among grape purchasing wineries and explore if a more intense use of long-term contracts is seen as a possible tool for improving competitiveness. Key research questions: 1. How are vineyard ownership and grape purchases distributed among wineries in RD? How many wineries rely only/mostly on own vineyards and how many buy a major part of their grape needs from independent growers? 2. Looking at the group of wineries that mainly buy grapes, how is the relationship with growers governed? What part of purchases are covered by long-term contracts, as opposed to purchases on a yearly spot market? What kind of contracts are used and what do they stipulate? 3. How satisfied are wineries with their current procurement models? Is there a trend towards more use of long-term contracts? Do they believe more formal long-term contracts could help them to achieve better quality on more competitive terms? If so, how should contracts fix grape prices?

Background and Context: Explain what is currently known about the topic and address why this topic requires/offers opportunities for further research. (no more than 200 words)	Some academic research on current practices in grape supply chain management worldwide has been published. The use of grape supply contracts has been analysed mostly in the countries of the New World, but research in Spain is scarce and limited mainly to Rioja. The author is not aware of any research on this topic in the Ribera del Duero. While the D.O. RD has been a remarkable success story from the early 1990s to the late 2010s, in the last years its growth has stalled. Since the economic downturn of 2007-2010, the region suffers from its high dependency on the domestic market. Like other appellations, RD is seeing a polarization between a few prestigious estate producers at the top and volume-oriented bottlers at the lower end. Mid-sized wineries are under pressure to differentiate their offer and better integration of viticulture and winemaking is seen as a factor to achieve this. The RP wishes to explore the relationship between grape growers and wineries in this context, specifically the degree of use of contracts and their perceived importance as a competitive factor for wineries that cannot (or choose not to) have a high degree of vertical integration / vineyard ownership.
Sources: Identify the nature of your source materials (official documents, books, articles, other studies, etc.) and give principle sources if appropriate. (no more than 150 words)	Literature review about procurement practices in the wine industry and use of contracts in viticulture. Important references are Fraser (2003) and Fernandez-Olmos (2008) as well as previous research of practices in other countries, e.g. Goodhue (2003) in California; Baldwin, Orr & Simon (2007) in Australia; Codron, Montagne & Rousset (2013) in Argentina. Fernandez-Olmos has studied the use of contracts in Rioja. Literature about supply chain management and co-ordination in the wine business, e.g. Franken (2014). Literature on contract design and management of the supply function.

	Literature on the market structure and viticultural areas of Castilla y León. Figures publishes by: - Consejo Regulador de la Denominación de Origen Ribera del Duero. - Local Government of Castilla y León. - Spanish Ministry of Agriculture. - Observatorio Español de los Mercados del Vino - Federación Española del Vino - Specialized Press including La Semana Vitivinícola Websites of wineries
Research Methodology: Please detail how you will identify and gather the material or information necessary to answer the research question(s) and discuss what techniques you will use to analyse this information. (no more than 500 words)	For research question 1, data from the Consejo Regulador on existing wineries will be cross-referenced with information published by or provided by the wineries themselves on vineyard ownership. Online research of winery websites backed up with brief telephone interviews where necessary, should make it possible to group the 266 wineries registered in RD into pure or mainly estate operations, co-operatives and those who purchase a major part of their grapes. This information will be analysed and then represented graphically. For research question 2, a representative sample of grape buying wineries will be selected for in-depth personal interviews with senior staff, based on a semi-structured questionnaire. The data obtained will be tabulated and analysed for patterns and compared to data from other markets published in the literature. The information will be complemented and supported with data from in-depth interviews with official bodies, including the Federación Española del Vino and the Observatorio Español de Mercados del Vino. For research question 3, a smaller sample of wineries using or interested in using longer-term contracts will be selected for in-depth interviews, which will be analysed qualitatively. Additional interviews with a sample of 3-4 grape

	growers, at least one co-operative and the local branch of Asaja (Asociación de Jovenes Agricultores) will be done to add the perspective of the grape suppliers.
Potential to Contribute to the Body of Knowledge on Wine: Explain how this Research Paper will add to the current body of knowledge on this subject. (no more than 150 words)	The paper will contribute to a better understanding of the supply dynamics in an important region of Spain. As RD is one of the leading quality regions in Spain, any findings on the use of contracts and procurement practices will also be relevant for other regions. Historically, the Spanish wine industry has seen a certain lack of integration between viticulture and winemaking, outside small domaines and co-operatives. In this context, exploring the use of long-term contracts as a tool for better supply chain co-ordination is especially relevant. RD faces a challenge to maintain a sustainable level of sales, in view of the major increase in its production capacity over the last decades, the marked fall in domestic wine consumption and the weak international presence of the appellation. Grape procurement has not been researched in the region as a competitive factor.

Proposed Time Schedule/Programme: This section should provide a summary of the time schedule for the research, analysis and write-up of the Research Paper and should indicate approximate dates with key deliverables.	**November 2015** Finish literature review on grape sourcing, use of contracts, vertical co-ordination, writing of initial bibliography. Preliminary interviews with 3-5 producers who buy a substantial part of their grapes, as well as the Consejo Regulador, to obtain input on research questions and recommendations for approaching the problem. **December 2015** Online research of individual wineries and telephone interviews where needed to determine level of vineyard ownership and classification of 266 wineries. Decision on sample of grape buying wineries, identification of contact persons, request meetings in Jan/Feb Interviews with the FEV and the OEMV **January – February 2016** Design and testing of questionnaire Research and tabulation of general information of the region Conduct interviews with wineries and growers Start summarizing data **March 2016** Finalize interviews, tabulation and analysis of data and presentation **April 2016** Writing of RP **May 2016** Editing, correcting **June 2016** Submission

Appendix B: Translation of the semi-structured questionnaire used during the in-depth interviews with wineries

Date of interview:

Name of company / organization:

Name and position of interviewee:

1. How many Kg of grapes did you process in the 2015 vintage?
2. What percentage of this quantity came from own vineyards (define own vineyards)?
3. What is your average production per year in liters? And in number of bottles?
4. What percentage of sales are exported?
5. Do you buy or sell any wine in bulk? If so, what percentage of your production from the 2015 harvest?
6. Do you buy grapes from independent growers? If so, from how many different growers?
7. What percentage of transactions with independent growers are governed by a contract:
    a. Only verbal, besides the compulsory legal sales contract
    b. A written agreement stipulating more than the minimum legal contract
    c. A combination of written and verbal agreements
8. What percentage of contracts/agreements with growers are annual vs. pluri-annual?
9. How much fluctuation is there among supplying growers? How long have they been supplying you on average?
10. How many different contracts do you offer to growers, is there more than one standard contract?
11. Please indicate if the contract specifies:
    a. The quantity of grapes to be purchased in Kilograms
    b. The number of hectares from which the grapes come
    c. The specific parcels of vineyard where the grapes come from
    d. Quality parameters. Which ones? Is price linked to them? If so, how?
        i. Potential ABV
        ii. Sanitary condition
        iii. Colour/phenolic index
        iv. Others
    e. Viticultural practices
    f. Price: absolute, by Kg, by Ha, indexed to market? How?
    g. Terms of payment
12. At which moment in time does the winery inform the grower about the quantity of grapes to be purchased? And about the price?
13. If the price is indexed to market, how is this price fixed? Is there a minimum, a window, a bonus system?
14. Do you classify/rate growers in groups? Do you offer a menu of contracts? Do you try to give incentives to be in a different category?
15. Does the winery classify grapes by target product range? Does the winery link specific growers/vineyard parcels to product ranges/price levels?
16. How many visits does the technical team from the winery do to independent growers' vineyards?

17. Does the contract specify penalties in case of non-compliance of either part?
18. Does the contract specify any conflict resolution mechanisms or third-party arbitration besides the courts?
19. Can you give examples of recent conflicts with growers, their reasons and how they were solved?
20. Please indicate if the winery participates (demands/requests/recommends…) in decisions about the following points. Does the contract specify this?
    a. Winter pruning
    b. Irrigation
    c. Fertilization
    d. Pesticide use
    e. Harvest time and method
21. Does the contract foresee a compensation to the grower in case of crop loss?
22. To what degree is the winery prepared to assume part of the agricultural risk of loss of volume / loss of quality / price variation?
23. What tolerance toward price variation does the winery have? And your growers?
24. Please indicate your level of agreement with the following statements (0 – not all all; 5 – fully in agreement)
    a. Generally, we are able to obtain the supply of the grapes we want, in the quantity and quality that we need.
    b. The quality of the grapes that we obtain from own vineyards is superior to those of independent growers.
    c. The growers we buy from generally keep their word
    d. The duration of the relationship is more important than a contract to motivate the growers to keep their commitments
    e. The existence of a formal contract helps to obtain better supply in better conditions over the long run
    f. Because of the climatic conditions of the appellation, the best grapes are not always from the same vineyards and the use of grapes from certain vineyards varies a lot between years
    g. The variation in yields between years makes a good co-ordination between growers and wineries especially important.
    h. The combination of a formal contract with relational management is the best possible formula to govern the relationship with growers
25. How satisfied are you with your current supply system for grapes? What could be improved?
26. Are you likely to increase your own vineyard surface in the future? Why?
27. Do you believe you will use more formal and longer term contracts in the future?
28. Do you think more formal and longer term contracts could give you competitive advantages?
29. Do you use any kind of hybrid system of vertical co-ordination, like long-term vineyard leases, management contracts, etc.? Do you think such formulas will become more frequent in the future?
30. What are in your view the biggest obstacles that hinder the use of more formal and longer term contracts?

General questions about the D.O.:

31. How would you describe the current situation of the D.O. and the outlook for its future?
32. What percentage of grapes in the D.O. do you think come from own vineyards?

33. What percentage of wine in the D.O. is sold in bulk, in an average year?
34. What is the average production cost per hectare for old and new vineyards? What is the minimum price per Kg of grape for the grower to cover costs?
35. Do you detect any change of attitude among (younger?/more professional?/bigger?) growers to sign more formal/longer-term contracts?

Appendix C: Alphabetical List of Wineries Interviewed

Name of winery	Person interviewed	Position in company
3 Ases Bodegas y Viñedos S.L.	César Arranz	Owner
Aalto Bodegas y Viñedos, S.A.	Javier Zaccagnini	CEO
Adrada Ecológica, S.L.	Jesús Lázaro	Owner
Alejandro Fernández-Tinto Pesquera, S.L.	Lucía Fernandez	MD
Altos de Ontañón, S.L.	Felix Domingo	Winemaker
Bodega COOP. Virgen de la Asunción	Pedro Ronda	Managing Director
Bodega Emina, S.L.	Felix González	Head of Buying
Bodega Pagos del Rey, S.L. (Felix Solis Avantis)	Carlos Nieto	Buying Director
Bodega San Roque de la Encina, SDAD. COOP.	Manuel Gonzalez	Managing Director
Bodegas Arco de Curiel, S.L.	Lolo Yebra	Winemaker
Bodegas Atalayas de Golbán (Avante Selecta)	Almudena Alberca	Winemaker
Bodegas Felix Callejo, S.A.	Noelia Callejo	Winemaker
Bodegas Garmón	Eduardo García Montaña	Owner and tecnical director
Bodegas Marta & Mate, S.L.	Manuel Rincón	Co-Owner
Bodega Matarromera, S.L.	Felix González	Head of Buying
Bodegas Peñalba López, S.L.	Miguel Angel Peñalba	Director of Viticulture
Bodegas Portia, S.L. (Grupo Faustino)	Raúl Quemada	Winemaker
Bodegas Riberalta, S.A.	Francisco Martin	Manager
Bodegas S. Arroyo, S.L.	Iker Arroyo	Managing Director
Bodegas Santa Eulalia, S.A.	Laura Sardina	Winemaker
Bodegas Señorío de Nava, S.A.	Iván Gutiérrez	Winemaker
Bodegas Tionio, S.A.	Guillermo Pérez	Winemaker - Tecnical Director
Bodegas Trus, S.L.	Rafael García	Winemaker
Bodegas Vega Sicilia, S.A.	Enrique Macías	Head of Viticulture
Bodegas Viña Vilano, SDAD.COOP.	Desiderio Sastre	Managing Director
Bodegas y Viñedos Alion, S.A.	Enrique Macías	Head of Viticulture
Bodegas y Viñedos Rauda, SDAD. COOP.	Guillermo de la Vega	Technical Director
Bodegas y Viñedos Valtravieso, S.L.	Ricardo Velasco	Winemaker - Tecnical Director
Comenge Bodegas y Viñedos, S.A.	Rafael Cuerda	Winemaker
Dominio de Atauta, S.L.	Almudena Alberca	Winemaker
Dominio de Pingus, S.L.	Peter Sisseck	Managing Director

Ebano Bodegas y Viñedos, S.L.	Carlos Gomez Davila	MD
Explotaciones Valduero, S.A.	Yolanda Garcia Viadero	Tecnical Director
Finca Villacreces, S.L.	Lluis Laso	Winemaker - Tecnical Director
Grandes Bodegas S.A. (Marques de Velilla)	Gonzalo Coronado	Manager
Hacienda Miguel Sanz, S.L.	Antonio Miguel Sanz	CEO
Hijos de Antonio Barceló, S.A. (Viña Mayor)	Almudena Alberca	Tecnical Director
Legaris, S.L. (Grupo Codorníu)	Isabel Fernández	Winemaker
Pago de Carraovejas, S.L.	Almudena Calvo	Winemaker
Protos Bodegas S.L.	Carlos Villar	CEO
Rodero Calderari Juan Pablo y Ricardo, S.C.	Juan Pablo Rodero	Co-Owner
Selección de Torres, S.L.	Rubén Redondo	Winemaker
Viña Arnaiz, S.A. (Grupo J.G. Carrión)	Rafael Arévalo	Tecnical Director

Appendix D: List of Grape Growers Interviewed

Name of grower
Alba Chico Ballesteros, owners of 35 hectares in Valladolid and Burgos
Abdon Segovia, owners of 80 hectares in Burgos
Adrian Viyuela, owner of 30 hectares in Roa
Antonio Diez, owners of 3 hectares in Burgos
Eduardo Santamaría, owners of 60 hectares in Burgos
Jesús Lázaro, owner of 21 hectares in Burgos
Jesús Yuste, owner of 90 hectares in Burgos
José Manuel Lobato, owner of 22 hectares in Burgos and Valladolid
María Castillejo, owners of 35 hectares in Valladolid
Miguel Angel Peñalba, owners of 170 hectares in Burgos
Oscar Tomás, owners of 27 hectares in Valladolid
Sergio García, owners of 18 hectares in Soria

Appendix E: List of Other Interviews

Name of Organization	**Person interviewed**	**Position**
Consejo Regulador de la D.O. Ribera del Duero	Agustín Alonso	Tecnical Director
Consejo Regulador de la D.O. Ribera del Duero	Miguel Sanz Cabrejas	Director General
FEV – Federación Española del Vino	Pau Roca	Director General
OEMV – Observatorio Español de los Mercados del Vino	Rafael del Rey	Director General
ASEBOR – Asociación Empresarial de Bodegas D.O. Ribera del Duero	Iker Ugarte	President
Momentum Investments	Luis Sanchez-Guerra	CEO