

Coordinating for Quality: How Cooperatives can beat Private Wineries on Quality and Reputation

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- *Purpose: We address if cooperatives can compete with private wineries regarding product quality and reputation. Cooperative reputation for quality is subject to individual growers supplying varying grape qualities and on their management ability to produce and market high quality wine. Hence, cooperatives may face varying grape qualities with more uncertainty about wine quality further downstream. In contrast, private firms may have more control over production and in turn gain a higher reputation with final consumers.*
- *Design: We analyze a data set for private and cooperative wineries from Alto Adige with retail prices and relevant evaluations for wine quality and producer reputation. It allows to differentiate local cooperatives vs. private wineries as well as IGT and DOC designations. We employ a hedonic pricing model to test whether wines from private producers receive a reputation premium relative to cooperatively produced wines. Moreover, we hypothesize that wines from private wineries receive a price premium relative to cooperatively produced wine.*
- *Findings: Our results reject the hypothesis that relative to cooperatives, private producers receive a reputation premium. In contrast, we estimate a significantly positive cooperative reputation premium as well as a significant quality premium. Regional cooperatives and privately owned firms evolve towards segmenting IGT and DOC denominations. Cooperatives get a collective reputation premium by focusing on DOC rules while non-cooperatives use an IGT strategy emphasizing their brands.*
- *Practical implications: Our results indicate that cooperatives are able to successfully coordinate for improved grape quality and to receive a quality and reputation premium in the market. The strategic use of denomination rules allows private wineries and cooperatives to capture premium prices in different market segments.*

Key Words: Cooperatives, coordination, quality, segmentation

1. Introduction

Privately owned firms and cooperatives represent ownership forms that can be found concurrently in many markets throughout the world (Sexton and Lavoie, 2001; Van Bekkum and van Dijk, 1997). Even in the U.S., cooperative enterprises are predominant in a number of industries including agriculture where they market as much as 1/3 of total production (Hansmann, 1996). In the European Union (EU), farmer-owned cooperatives are responsible for over 60% of the harvest, handling and marketing of agricultural products (GCAC, 2000). Thus, a large share of agricultural produce is marketed by farmer-owned cooperatives, but increasingly concerns are raised about their effectiveness. In Europe, recent changes of the common agricultural policy imply that production and marketing of these products must meet specific requirements (improved quality management and marketing conditions, production efficiency etc.) in order to comply with internal support regulations and to attain competitive positions within Europe as well as internationally. Both marketers and politicians have identified the need for cooperatives to move towards more market orientation. In turn this has raised questions about the suitability of traditional cooperative arrangements to support a more market-oriented strategy (Beverland, 2005).

We propose a model of product quality and reputation of cooperatives versus privately owned firms and how they are reflected in market prices. As an application, we examine the wine sector in the province of Alto Adige in Northern Italy where about 70% of the total wine production is marketed through cooperatives. For comparison, this is more than twice as much as in Germany where about 1/3 of the total production is processed and marketed by cooperatives (DRV, 2009). Product quality and reputation crucially affect product prices. Depending on the producer, considerable price differences exist even between similar products. In the case of wine, we often observe that a bottle produced and marketed by a cooperative sells for less than a bottle of comparable quality from a privately owned firm.

One explanation for this may be that cooperatives lack control over the entire production chain which can lead to larger variation in grape quality and hence higher uncertainty about wine quality further downstream. Thus, consumers face uncertainties regarding product quality and reputation for cooperatively produced wine. A cooperative's reputation for product quality depends on the contributions of individual members growing grapes subject to variation as well as on the cooperative management ability to produce high quality wine. In contrast, a privately owned firm can be characterized by a higher degree of control within the production chain and thus may also be able to gain higher levels of reputation.

In Alto Adige, wine cooperatives are characterized by modern production conditions and utilization of cutting-edge vineyard management systems. For example, they require that growers are cutting back on grape tonnage at certain predefined times during the growing season in order to limit yields, thus raising grape quality and wine quality further down the production line. Therefore, it would be interesting to see if the cooperatives are able to claim sufficient control of the production chain relative to non-cooperative producers such that the hypothesized difference in the wine quality and reputation premium disappears. Thus, this paper will focus on the quality provision of cooperatives vs. privately owned firms. We attempt to answer the following questions: Does it make sense for cooperatives to compete on quality or prices vis-à-vis privately owned firms with a higher degree of quality control? Are cooperatives able to coordinate and manage production in order to compete more effectively with privately owned firms especially in terms of quality? And finally, how are regional cooperatives and privately owned firms segmenting the market?

2. Previous Research

Very few studies have analyzed the relationship between ownership structure and product quality. Hoffmann (2005) applies game theory to analyze cooperatives vs. investor owned firms (IOF) in a duopoly framework with simultaneous quality choice and price competitions. With fixed cost of quality, IOFs charge higher prices and generate larger consumer surpluses than coops by marketing higher qualities. With variable cost of quality, coops have a structural cost advantage which is used to market larger quantities of higher quality product generating larger profits, larger consumer surplus and larger social welfare. Thus, firms can have a cost advantage due to ownership structure in addition to a quality advantage. Coelho et al. (2008) examine the financial performance of cooperatives and IOFs with respect to profits, leverage, solvency and efficiency. They largely confirm their hypotheses that IOFs tend to outpace cooperatives in terms of profits, solvency and efficiency while coops are expected to have more leverage.

Theoretical models on the determinants of product prices stress production costs, product quality, and strategic behavior. In this context, monopolistic competition models (e.g. Helpman and Krugman, 1985), quality differentiated markets (e.g. Tirole, 1988), and spatial considerations (e.g. Fujita et al., 1999) should be mentioned. Shapiro (1983) examines the effect of producer reputation affects prices. Assuming competitive markets and imperfect consumer information, he shows that reputation yields a premium for high-quality producers, which may be interpreted as revenue for investments in their reputation. In Tirole (1996), collective reputation is the aggregate of individual producer reputations. With past and current actions affecting producer incentives, he shows that new producers may suffer from prior mistakes of older producers even after they have disappeared. In a seminal paper, Bonus (1986) has analyzed cooperative business behavior using a transaction cost approach.

Economists often use hedonic models based on Rosen (1974) to study price-quality relations empirically. In his seminal paper, Rosen posits that goods are valued for their utility-generating attributes. Consumers evaluate such attributes when making a purchasing decision. Competitive markets define implicit prices for these utility-generating attributes and the product price is the sum of implicit prices. Many studies have applied hedonic models defining implicit prices for wine quality and reputation attributes. For a review of the relevant empirical literature, we refer to San Martin, Troncoso and Brümmer (2008).

Schamel (2008) analyzes the cooperative wineries in Germany and concludes that cooperatively produced wines seem to lag behind in terms of strategically addressing the opportunities presented in today's global wine market (i.e. varietal wines with aging potential that are competitive in terms of quality). Instead, cooperatives have opted for barrique-style wines and Chardonnay for which they gain higher implicit prices relative to non-coops. To our knowledge, no other empirical study has examined the relationship between product pricing and ownership structure, product quality and reputation.

3. Data and Analysis

We analyze a data set of wines evaluated in the annual Gault Millau Wine Guide 2010 for the Alto Adige region in northern Italy. Descriptive statistics of the usable sample consisted of 392 observations are given in **Table 1**. The guide lists a range of applicable retail prices per bottle which we use to calculate an average retail price for our estimation purpose. The price information used in the estimation is pre-competition and does not reflect any direct

effects from a favorable quality rating. The guide rates the wine according to a 20-point scale in half-point steps. Information on the number of bottles produced is also provided. The age of the wines at the time of evaluation ranged from 1 to 7 years in the usable sample. Finally, the guide provides a star-ranking (ranging between 0 and 3) for a winery's distinctiveness which could be regarded as a proxy for winery reputation.

The data set also denotes wine color, sweet or desert wines, IGT and Riserva designated wines, eco-labeled wine, wine variety and regional origin. Moreover, the data set allows to differentiate whether a wine was produced by a local cooperative or not and is representative in this regard (cooperative share $\approx 37\%$). In **Table 1**, we differentiate quantitative and qualitative variables used in the estimation. Cooperatively produced wines, red vs. white wines, sweet wines, IGT vs. DOC designated wines, Riserva categorized wines, and Eco-labeled wines are regular dummy variables while wine variety and regional origin are categorical dummies. As the dependent variable we use the logarithm of the average retail price [$\log(\text{Price})$].

We hypothesize that wines coming from privately owned producers receives a price premium relative to cooperatively produced wine. To test this hypothesis, we employ a hedonic pricing model differentiating cooperative vs. non-cooperative producers. We would then look for a negative coefficient in the whole sample for cooperatively produced wine (Coop = dummy variable as an indicator for the collective reputation of cooperatives) and/or a lower price premium for wine quality evaluation (coefficient on the point rating) in the cooperative subsample relative to the non-coop subsample.

We employ a log-linear function for the estimation. Following Oczkowski (1994), we employed a RESET test which rejected other functional forms (i.e. inverse, linear). Thus, we first estimate the following regression model:

$$\log(P_i) = \alpha + \beta_1 \log(\text{points}) + \beta_2 \log(\text{Bottles}) + \beta_3 \text{Age} + \beta_4 \text{Stars} + \gamma_1 \text{Red} + \gamma_2 \text{Sweet} + \gamma_3 \text{IGT} \\ + \gamma_4 \text{Riserva} + \gamma_5 \text{Eco} + \gamma_6 \text{Variety}_i + \gamma_7 \text{Region}_j + \eta \text{Coop} + \theta_k \text{Vintage} + \varepsilon_i$$

where $\log(P_i)$ is the logarithm of price P_i , $\log(\text{points})$ is the logarithm of the Gault Millau points and $\log(\text{Bottles})$ is the logarithm of the production quantity, Coop is a while ε_i is the error term with a zero mean and uniform variance.

The equation above includes a number of other variables to control for willingness to pay (price) effects due to:

- production quantity (scarcity effect implied by the number of bottles produced) β_2
- wine age (storage premium due to age in years at the time of evaluation) β_3
- star ranking (winery reputation effect) β_4
- red vs. white wines (red wine premium) γ_1
- sweet or dessert wines (sweet wine premium) γ_2
- IGT classification (effect due to avoiding DOC rules) γ_3
- Riserva categorized wines (designation premium) γ_4
- Eco-labeled wines (eco-premium) γ_5
- wine variety (varietal premium) γ_{6i}
- sub-regional origin (regional premium) γ_{7j} .
- vintage premium (dummy) θ_k

Given its log-linear functional form, estimating the equation above yields price premiums and discounts relative to the contribution of the base category ('generic' variety non-sweet white DOC wine that is not eco-labeled and not Riserva categorized).

To test the hypothesis that wines coming from privately owned producers receive a reputation premium relative to cooperatively produced wine, we expect a significant but negative coefficient in the whole sample for cooperatively produced wine (dummy variable as an indicator for the collective reputation of cooperatives) and/or a lower price premium for wine quality evaluation in estimating the cooperative subsample (significant coefficient on the Gault Millau point rating) relative to the non-coop subsample.

In a second estimation, we include interaction terms between IGT/DOC denominations and ownership structure (Coop/NonCoop) to see if there is a strategic orientation towards specific denomination rules given different ownership structures. Our expected result is that cooperatives concentrate on DOC rules while private wineries increasingly avoid adhering to DOC rules, marketing and branding distinctly different wines. We estimate this modified equation on the whole sample with DOC wines produced by cooperatives being the base category. The three remaining interaction terms are defined as follows:

- IGT * NonCoop or IGT classified wine produced by privately owned wineries
- IGT * Coop or IGT classified wine produced by cooperatives
- DOC * NonCoop or DOC classified wine produced by privately owned wineries

4. Results

The results of the estimation are listed in **Table 2**. We cannot confirm the hypothesis that wines coming from privately owned producers receive a reputation premium relative to cooperatively produced wines. On the contrary, our estimation of the whole sample reveals a significant but positive coefficient on the cooperative reputation dummy. This would indicate that Alto Adige cooperative receive a collective reputation premium (about 8%) relative to their local privately owned competitors. This is even more remarkable given the fact that the model corrects for individual winery reputation through the star-ranking.

Comparing the quality premium (coefficients on the points rating) in the cooperatively produced subsample relative to the non-coop subsample we can also confirm that the posted hypothesis is not correct, i.e. cooperatively produced wines receive a significant quality premium relative to non-coop wines. In fact the point elasticity in the cooperative subsample is about 12% larger than in the non-coop subsample. Thus, we can confirm that cooperatives in Alto Adige are characterized by modern production conditions, efficient horizontal coordination using cutting-edge vineyard management systems which in the end result in a positive reputation premium as well as a significant quality premium relative to their local privately owned competitors. The vintage dummies are all significant relative to the most recent base year (2009) except for 2006 which was considered an inferior vintage.

Thus, our analysis suggests that these cooperatives are able to claim sufficient control of the production chain relative to non-cooperative producers such that the hypothesized difference in the wine quality and reputation premium disappears. In practice, this is due to requiring growers to cut down the grape tonnage at certain predefined times during the growing season in order to limit yields (often way below the DOC maximum), thus raising grape quality and wine quality further down the production line.

The remaining results on the control variables listed in **Table 2** are as expected in terms of sign and magnitude relative to other studies. For example, the storage effect (wine age) is relatively consistent across the three subsamples and indicates a 3.5% age premium. The red wine premium is around 25%, but somewhat lower in the cooperative subsample. It is interesting to note that eco-labeled wine has a positive coefficient which is in contrast to other studies that have claimed the opposite (Delmas and Grant, 2010).

A further result is noteworthy in **Table 2**. The coefficient for IGT wines is negative in the cooperative subsample but positive in the non-coop subsample. This indicates that cooperatives emphasizing production according to DOC use IGT classification to sell of lower quality grapes while non-cooperatives use IGT to market branded wines while avoiding DOC rules. We argue that this strategic orientation is confirmed by our results. Cooperatives get a collective reputation premium for focusing on DOC rules while their non-cooperative competitors use an IGT strategy emphasizing branding.

Finally, in **Table 3** we list the results including the interaction terms between IGT/DOC denominations and ownership structure. Comparing IGT and DOC denominations, the estimated coefficients indicate that cooperatives emphasize DOC production and use IGT to for lower quality grapes, while private producers avoid DOC rules and use IGT to market distinctly different wines often with specific brand names. Cooperatives get a collective reputation premium focusing on DOC rules while their IGT wines are sold at a discount of about 17%. Private wineries use an IGT strategy emphasizing their brand name and obtain a price premium of about 12.5% for their IGT denominated wines and a discount of about 9% for their DOC wines relative to the base category (i.e. a cooperatively produced DOC wine). The relative competitiveness between regional cooperatives and privately owned firms evolves towards a segmentation. Thus, our expectation is confirmed: cooperatives focus on DOC wines while private wineries at least to some degree void DOC rules to market and brand distinctly different wines.

5. Summary and Conclusion

In this paper, we tested the hypothesis whether wines from privately owned producers receive a reputation premium relative to cooperatively produced wines. Moreover, we examine whether cooperatively produced wines receive a lower price premium relative to the non-coop wines. We could not confirm this hypothesis. On the contrary, our estimations revealed a significant and positive collective cooperative reputation premium relative to privately owned competitors in Alto Adige. This is even more notable given the fact that the model corrects for individual winery reputation. Moreover, we also confirm that cooperatively produced wines receive a significant quality premium relative to non-coop wines. In fact, the estimated coefficient is twice as large. Thus, modern production conditions and the use of yield management systems result in a positive reputation premium as well as a significant quality premium relative to their local privately owned competitors for Alto Adige wine cooperatives. Thus, are able to compete and even beat privately owned wineries on quality and reputation indicators

Moreover, comparing IGT and DOC denominations, our results indicate that cooperatives focus on DOC production and use the possibility of IGT to sell of lower quality grapes, while private producers at least partly avoiding DOC rules use IGT denominations to market distinct wine under their brands. Thus, cooperatives get a collective reputation premium

focusing on DOC rules while their private competitors use a strategy focusing at least partly on IGT denominated wines. Cooperatives get a collective reputation premium by focusing on DOC rules while their non-cooperative competitors use an IGT strategy to derive price premiums for individually branded wines.

Hence, we can derive recommendations on quality provision and reputation building for cooperatives vs. private firms within a regional market setting. It seems sensible for local cooperatives to compete on quality vs. privately owned firms. They are able to manage production in order to effectively compete with private firms especially in terms of quality provision because they seem to have captured a high degree of quality control along their production chain. The relative competitiveness between regional cooperatives and privately owned firms evolves towards a segmentation as cooperatives get a collective reputation premium focusing on DOC rules while their non-cooperative competitors use an IGT strategy emphasizing their own brands to derive price premiums.

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Table 1: Descriptive Statistics

Quantitative Variables

	#	Average	St. Dev.	Minimum	Maximum
Price	2357	14.81	6.76	5.00	56.00
Points	2357	15.32	1.20	12	19
Bottles	2357	15,740	27,290	430	400,000
Age	2357	2.67	1.538	1	7
Star Rank	2357	0.506	0.769	0	3

Qualitative Variables

	#	Av. Price	Min. Price	Max. Price	Av. Points
Cooperatives	873	15.33	6.00	42.00	15.41
Non-Coops	1484	14.50	5.00	56.00	15.27
White Wine	1369	13.59	6.00	48.00	15.56
Red Wine	988	16.51	5.00	56.00	15.00
Sweet	129	26.02	15.00	48.00	16.04
IGT	121	19.71	6.00	56.00	15.71
Riserva	337	18.81	7.00	36.00	15.40
Eco-Label	137	16.32	8.00	56.00	15.37
Schiava	106	8.09	5.00	12.00	14.27
Gewürztraminer	234	17.48	8.00	48.00	15.56
Lagrein	275	16.04	6.00	36.00	15.12
Sauvignon	226	13.39	7.00	38.00	15.42
Pinot Blanc	192	10.48	7.00	22.00	15.32
Bolzano	384	14.74	6.00	36.00	15.09
Ueberetsch	762	14.85	6.00	56.00	15.21
Unterland	545	14.81	6.00	42.00	15.44
2009	258	11.76	6.00	24.00	15.88
2008	293	13.99	6.00	42.00	15.80
2007	467	14.22	6.00	56.00	15.20
2006	497	14.24	6.00	42.00	15.23
2005	473	14.70	6.00	56.00	15.03
2004	243	18.99	5.00	56.00	15.24
2003	126	19.75	9.00	56.00	15.18