Dynamic Analysis of Brand and Regional Reputation: The Case of Wine*

Günter Schamel[a]

Abstract

Globalization has created an international wine market and global brands. However, consumers continue to regard regional origin as a dominant criterion in their wine buying decisions. Indicators of collective regional reputation as well as individual producer (or brand) reputation guide consumers in their buying decisions. We measure regional and brand reputation indicators for 27 growing regions around the world. Regional reputation is based on a region's overall quality performance through time. Positive and negative brand reputation based on relative regional peer performance is a distinct feature of this empirical application. Noting competing as well as common interest among regional producers, we hypothesize that wines from producers with a high quality reputation rely more on their own strengths and will depend less on their region's reputation and vice versa. We also test whether this assertion is valid over time covering six recent vintages. We apply a hedonic model to measure the significance of these regional and brand reputation indicators in determining wine prices. Our model largely confirms our hypothesis, but it also suggests that for some regions (Germany and New Zealand), high quality brands rely heavily on overall regional reputation. In other regions (including Napa and Sonoma Valley), high reputation brands seem to lose their strength and start to rely on regional reputation. Regions holding on to their strong individual brand reputations include the Rhone Valley, Spain, and Bordeaux. The analysis sheds light on how regional and producer brands are performing as wine markets mature in terms of global branding and consumers becoming more knowledgeable about wine regions, quality, and reputation. (JEL Classification: D4, L1, Q13)

I. Introduction

Demand for specific and identifiable characteristics, including methods of production and geographical origin offers expanded market opportunities for food and beverage products. Outlets for high-value products encourage producers to diversify production and focus on quality. Consumers are able to choose products on the basis of their specific characteristics and to reward them with premium prices in the market. In turn, producers will get the economic benefits from their investment in quality, specificity, regional as well as individual brand recognition.

We often observe price differences for otherwise similar products seemingly based on regional origin. Trade economists have stressed the importance of production cost, product quality, and strategic behavior and associate product origin with a reputation or quality measure (Brooks, 2001). However, this may neglect the impact of subjective preferences based on marketing, brands or product loyalty. For instance, producers from California's Napa Valley known for their high quality wine typically can sell their product at higher prices than those of comparable quality from lesser-known producers in other region. We explain such observations by positing that individual reputation indicators and regional origin affect purchase decisions.

We analyze the demand for different wine varieties evaluating quality aspects based on expert opinion and evaluation. Expert evaluations need to make a sufficiently clear distinction between the qualities available in the market, or consumer will not take them into account in their buying decisions. In our analysis, we use price data that is collected at the time when product quality is evaluated by product experts. When consumers are confronted with a range of qualities, we argue that expert quality evaluations are an important factor directing them to products with the specific quality attributes that they look for.

Our analysis presents a detailed exposition of quality based performance measures. They are isolated as a crucial factor in raising the likelihood that consumers have heard about a product's quality prior to a purchase as well as a crucial factor in attracting consumer awareness for individual producers, associated producer groups and/or wine growing regions. In this respect, expert quality evaluations will direct consumer to specific products or product groups with specific value attributes. Over time, such quality evaluations establish a record of quality performance signaling quality reputation to consumers.

However, there are reasons to believe that such quality evaluations are not fully dispersed across all potential consumers. Arrow (1974) notes limited information-handling ability (bounded rationality) as an essential part of human (i.e. consumer) behavior. While choosing among all possible alternatives, only a few are actually considered (Simon, 1997). In the case of wine, there is an almost infinite amount of quality evaluations available. For example, *Wine Spectator* publishes around 10,000 wine quality assessments each year. Consumers can only take a small part of this information into account and will make their own value assessments also relying on reputation indicators related to producers (brands),

regional origin, and varietals. Given that consumers have limited attention levels, not all quality signals will receive equal notice. We assume that the attention level that consumers pay to positive (negative) quality signals is higher for producers that perform significantly above (below) their average peers. Based on this, we argue that unusually high as well as unusually low quality relative peer performance form a lasting impression and define high and low quality producers in the minds of consumers.

Appropriate research into price-quality relationships will not only look at present quality assessments, but also consider indicators of *reputation*. In Shapiro's (1983) model of reputation formation, the sum of all relevant current and previous quality assessments establishes a quality based performance record (reputation) that is reflected in current prices. In this paper, we assume that consumers have a limited information-handling ability (Arrow, 1974) and calculate brand reputation based on a four vintage peer performance record.

In this paper, we apply a hedonic model to estimate the potential impact of geographical origin on wine prices controlling for blind-tasted sensory quality, variety, *and* producer reputation to assess their significance in the global wine market. Moreover, we empirically test whether a positive individual brand reputation implies less reliance on the associated collective regional reputation indicator in determining wine prices.

II. Literature Review

Numerous studies have applied pricing hedonic models to estimate implicit prices for wine quality and reputation attributes. They are based on the notion that any product represents a bundle of utility-generating attributes. Rosen (1974) suggests that competitive implicit markets define prices for embodied product attributes, and that consumers evaluate product attributes (e.g. features of a car) when making a purchase. The observed market price is the sum of implicit prices for each quality attribute. Rosen recognizes an identification problem for supply and demand functions derived from hedonic models. Arguea and Hsiao (1993) show that identification is essentially a data issue which can be avoided by pooling cross-section and time-series data specific to a particular side of the market.

In addition to sensory quality and variety, brand and regional reputation will also affect wine prices since a bottle's quality is unknown until it is uncorked. Shapiro (1983) models producer reputation effects on prices in competitive markets but with imperfect information. Improving their knowledge about product quality is costly to consumers. He demonstrates that reputation allows high-quality producers to sell their items at a premium, which may be interpreted as return on investments in reputation building. In such an imperfect information environment, credible measures of product quality and reputation can be effective in reducing consumer decision-making costs. Expert quality evaluations are an important vehicle enabling consumers to learn about the quality reputation of producers and regions. Tirole (1996) presents a model of collective reputation as an aggregate of individual

reputations where current producers are affected by their own actions and past collective actions. Tirole shows that new producers may suffer from past mistakes and derives conditions under which the collective reputation can be regained. Winfree and McCluskey (2005) model collective reputation as a dynamic common resource problem and show that without firm traceability, chosen quality levels may be suboptimal for the group. Klein and Leffler (1981) show that a firm will invest in firm-specific sunk costs only if it can produce a high-quality good to gain a stream of future profits, which are not being realized if the firm "cheats" and produces a low-quality good.

Combris, Lecocq and Visser (1997) estimate a hedonic price equation and what is referred to as a jury grade equation to explain variations in price and quality for Bordeaux wine. Landon and Smith (1998) focus on a lagged reputation indicator in addition to sensory quality. They use a hedonic model to study the impact of current quality and reputation based on past quality demonstrations. Their main findings are: reputation has a large price impact; an established reputation is much more important than short-term quality improvements; and ignoring reputation indicators will overstate the impact of current quality on consumer behavior.

Oczkowski (2001) argues that single indicators of wine quality and reputation are imperfect measures because tasters' evaluations differ and thus contain measurement errors. Employing factor analysis and 2SLS, he finds significant reputation effects but insignificant quality effects. Brooks (2001) argues that traditional views of international competitiveness emphasize product quality and production cost and neglect the potential impact of marketing and brand development on export demand. Applying hedonic regression analysis, she controls for vintage, blind-tasting quality, variety and also cost differences. Cross-country comparisons that suggest that neither cost nor quality differences, but "country brands" affect a wine bottle's price in excess of 50 percent, while exchange rate effects are insignificant. Crucial for this conclusion is to interpret the premiums on regional dummies as a marketing premium as opposed to a quality premium.

Schamel (2000) estimates a model with blind-tasting sensory quality, variety, scarcity, and special designations examining seven regions and two varieties. He finds that consumers are willing to pay a higher quality premium for Chardonnay compared to Cabernet Sauvignon. In contrast, red wine consumers put a higher value on regional origin and product scarcity. This suggests that the public-good value is higher for red wine appellations and their producers would benefit more from collective marketing efforts. Schamel and Anderson (2003) evaluate wine quality and regional indicators for wines from Australia and New Zealand. Other empirical studies with specific applications to wine include Jones and Storchmann (2001), Haeger and Storchmann (2003), Anderson and Wood (2006) and Schamel (2006).

Several theoretical models (e.g. Holmström, 1982; Diamond, 1989) suggest that performance should have a different impact on expected ability according to how much "reputation" agents have accumulated. Reputation is usually considered to build gradually through

learning, i.e. after observing past performance. Modeling positive and negative brand reputation based on relative quality performance is a distinct feature of this empirical application. Consumers have an idea about brand's quality based on its relative regional performance. Consumer willingness to pay depends on expert opinions, wine age, varietal quality perceptions and regional origin effects. To assess the significance of such subjective perceptions on wine trade, we estimate the impact of regional origin *and* brand reputation on wine prices using a hedonic model. Moreover, we empirically test whether a positive (negative) brand reputation rely less (more) on regional reputation indicators. From this, we are able to derive some interesting implications with respect to market development and regional competitiveness. We also draw conclusions with respect to the correlation between prices and regional origin and the interpretation of brand values versus regional quality premiums.

III. Data and Analysis

We propose a hedonic model where the price of a particular wine is a function of important product attributes. The dependent variable is the logarithm of wine prices (P) in US\$.[1] Data source for this analysis are expert quality evaluations for wines from the *Wine Spectator* covering the vintages 1999 through 2004. The *Wine Spectator* publishes U.S. release prices, sensory wine quality ratings based on a 100-point scale (WSP) as well as special expert selections (value designation BB, cellar collectible CC). We also derive an indicator for high (HQ) and low (LQ) quality brands by calculating the deviation of a producer's average quality rating from their respective regional average. We assume that high quality (HQ) and low quality (LQ) brands deviate by at least one standard-deviation from their respective peer average. This procedure classifies about 20% of the wines in the sample as HQ and about 20% as LQ. Following the reasoning in the introductory section, we assume that only such quality demonstrations (either high or low) will be remembered by consumers who are characterized by limited information-handling ability (and thus will command a price premium or discount).

Table 1 provides more information on the data set with 56,661 observations. We differentiate 27 regions in eleven countries and sixteen varieties.[2] Table 2 lists the sample statistics for all regions covered in the model. Over time, regions establish a record of quality performance that signals reputation. Restricting the model to three four vintage periods reflects that consumers have limited attention levels available to affect regional reputation. Table 3 lists average regional quality (AQ) for three periods each spanning four vintages ('99–'02, '00–'03, '01–'04). The final column measures the change in AQ from the '99 to

---

[1] The reported price is a suggested retail price on *release* and prior to tasting. This price may differ from actual consumer transaction prices due to retail mark-ups and government taxes differ.

[2] New World wines (e.g. California, Australia) are labeled primarily by variety, while Old World wines (e.g. France, Spain) are labeled primarily by their region of origin. The online data set does not classify a "Cabernet Sauvignon" from "Bordeaux". Unless otherwise noted, Bordeaux style wines are grouped as Cabernet blends.

the '04 vintage. Note that the change in average prices from the '99–'02 period to the '01–'04 period is very small (0.9%).

In our analysis, we estimate the full sample for each vintage period. In addition, we also estimate two separate models for positive and negative brand reputations. Producer or brand reputation is defined on the deviation of quality for a producer relative to peer producers within their region (WSP average above/below regional average). A positive (negative) brand reputation means that the producer has outperformed (not outperformed) its regional peers in terms of its average quality produced over the last four years. This allows us to test whether or not a positive individual reputation (strong brand) will imply less reliance on the associated collective regional reputation indicator.

Table 1
Description of the Data

Variable		Short description
Price[1]	*P*	*Suggested retail price on release published by* Wine Spectator
Sensory quality[2]	*WSP*	*Wine Spectator* Points (blind tasting: min. 50, max. 100)
Specialty wine	*Spec*	e.g. Amarone, Beerenauslese (BA), Trocken-BA, Eiswein, etc.
High-quality brand	*HQ*	One (1) standard-deviation above regional average (dummy variable)
Low-quality brand	*LQ*	One (1) standard-deviation below regional average (dummy variable)
Value Designation[3]	*BB*	Best Buy, Smart Buy, Best Value (dummy variable)
Cellar Collectible[4]	*CC*	Cellar Selection, Collectibles (dummy variable)
Age	*Age*	Age of wine when judged (average = 2.34 years, range 0–6 years)
Region[5]	*Reg*	Regional origin (categorical dummy)
Variety	*Var*	Wine Varieties (categorical dummy)

[1] Release prices as published in *Wine Spectator* as well as online.

[2] Scale: 95–100 (classic; a great wine)
90–94 (outstanding; superior character and style)
80–89 (good to very good; with special qualities)
70–79 (average; drinkable, may have minor flaws)
60–69 (below average; drinkable, not recommended)
50–59 (poor; undrinkable, not recommended)

[3] Value for money designation awarded after blind tasting procedure (incl. best buy, smart buy, and best values).

[4] Includes cellar selections (will improve most with aging) and wines regarded as collectibles.

[5] Combined California regions are defined as follows:
South Coast incl. Santa Barbara Co., Paso Robles, Santa Maria, Santa Ynez, and Edna Vlys.
Bay Area/Central Coast incl. Bay Area, Central Coast, and Monterey Co.
Rest of California incl. Mendocino/Lake Co., Sierra Foothills and all other California wines/blends.

A control variable in the model is the age of the wine at time of sensory expert evaluation (*Age*). As we cover only six recent vintages in the model, the range of the age variable is 0–6 years. Further control variables are categorical dummies for wine variety (*Var*) and regional origin (*Reg*).

We use a mixed log-linear functional form to estimate the model. Similar models have been used in several papers employing data from *Wine Spectator* including Ramirez (2008),

Gokcekus and Fargnoli (2007). Thus, the core model estimated in this paper is:

$$\log(P) = \alpha + \beta_1 \log(\text{W}SP) + \gamma_1 HQ + \gamma_2 LQ + \gamma_3 BB + \gamma_4 CC +$$
$$\gamma_5 Spec + \delta Age + \eta_j Var + \theta_k Reg + \varepsilon \qquad (1)$$

Table 2
Regional Statistics (Full Data Set)

Regions	Count	Prices				Scores			
		Avg.	Std. Dev.	Min.	Max.	Avg.	Std. Dev.	Min.	Max.
Napa	3547	49.29	35.02	8	500	87.09	4.25	55	98
Sonoma	3154	33.72	16.92	7	175	86.56	4.01	55	98
Carneros	656	34.85	15.61	12	125	87.00	3.37	74	95
Bay Area/ Cent. Coast	777	32.87	18.70	8	165	85.92	4.19	55	95
South Coast	1640	31.09	13.28	8	115	86.46	3.79	55	97
Rest of California	1953	19.73	13.56	2	120	84.09	3.65	68	94
Oregon	1837	31.68	16.34	7	150	86.99	3.91	55	95
Washington	2050	27.28	16.02	4	200	87.68	3.29	68	98
Rest of N. America	1361	18.26	10.14	6	120	81.44	4.02	59	93
Argentina/ Uruguay	1201	19.16	17.81	4	155	84.60	4.67	55	96
Chile	1773	14.92	12.21	4	100	83.41	4.30	60	96
Australia	4069	26.67	24.71	5	400	86.76	3.52	71	99
New Zealand	1431	22.35	11.10	9	100	86.56	3.15	65	93
South Africa	1477	20.19	11.92	6	100	84.94	4.34	55	94
Burgundy	5016	58.99	52.88	7	635	86.58	4.87	55	98
Bordeaux	1719	53.58	104.46	8	1800	87.93	3.75	74	100
Rhone	2574	41.00	49.39	5	496	86.38	5.51	55	99
Languedoc- Rouss.	1266	15.32	9.63	5	75	84.40	4.24	68	94
Rest of France	2629	24.35	17.99	6	166	86.42	4.10	55	96
Tuscany	3819	33.89	27.22	7	340	86.05	3.92	59	100
Piedmont	2500	41.96	43.17	7	570	86.67	4.26	68	100
Northern Italy	1676	24.48	20.20	6	460	85.38	3.76	65	95
Rest of Italy	1360	22.40	17.10	6	220	84.55	4.02	50	95
Germany	2779	44.58	59.70	8	750	88.88	3.96	55	100
Austria	1413	33.08	18.02	8	117	87.23	3.43	68	97
Spain	1982	26.12	35.76	4	450	85.15	3.92	68	96
Rest of World	1002	21.06	16.62	4	125	85.03	4.19	72	97
Overall	56661	33.61	37.98	2	1800	86.19	4.34	50	100

Source: *Wine Spectator* online at www.winespectator.com.

Table 3
Relative Regional Reputation

Regions	Average Quality (AQ)		
	'99–'02	'00–'03	'01–'04
Rhone	85.12	85.87	87.01
Burgundy	86.02	86.85	87.56
Languedoc-Roussillon	83.47	84.45	84.97
Rest of World	84.41	85.07	85.63
Germany	88.58	88.88	89.53
Rest North America	81.25	81.57	82.20
Argentina/Uruguay	84.11	84.55	84.91
Australia	86.43	86.66	87.02
Oregon	86.67	86.99	87.19
Rest of France	86.24	86.50	86.73
Chile	83.20	83.39	83.65
Northern Italy	85.24	85.59	85.59
Sonoma	86.30	86.21	86.64
Washington	87.51	87.60	87.76
South Coast	86.26	86.24	86.49
Spain	85.19	85.40	85.33
Bay Area/Central Coast	85.86	85.72	85.98
South Africa	85.04	84.99	85.00
Rest of California	84.00	83.91	83.96
New Zealand	86.59	86.50	86.44
Carneros	87.06	86.80	86.87
Bordeaux	87.88	88.18	87.66
Austria	87.46	87.32	87.10
Tuscany	86.13	85.88	85.73
Rest of Italy	84.92	84.82	84.51
Napa	87.21	86.68	86.77
Piedmont	87.40	86.83	85.66
Overall Average	85.98	86.13	86.38

where $\log(P)$ is the logarithm of the suggested release price in US\$. Given the functional form this equation, β_1 measures the price elasticity of the quality rating. The γ coefficients measure the premiums/discounts for high/low-end quality producers, for the two special designations and for specialty wines. The δ coefficient for *Age* indicates the percentage premium paid for older and maturing wines while η and θ measure price premiums/ discounts for regional reputation and variety, respectively. *Reg* and *Var* are categorical dummy variable for regional origin and variety. Estimating the equation above yields

implicit prices for quality attributes relative to the contribution of the base control. Burgundy was chosen as the base region and Pinot Noir as the base variety.

IV. Estimation Results

Tables 4a–c list the results for the three periods analyzed. The first double column lists the estimation results for the full model while the other two double columns separate the results for positive and negative brand reputation. With respect to sensory expert evaluations in the full model, prices are highly elastic (e.g. about 3.7% or 1.20US$ at average prices for the period '99–'02). Indicators of HQ and LQ producer brands also affect prices significantly. It is interesting that HQ producers receive higher premiums (+28 to +31%) compared to the discount for the LQ producers (–10 to –12%).

Table 4a
Regression Results for Vintages 1999–2002 [dep. variable = log(Price)]†

Parameter	All Wines		+ Brand Reputation		– Brand Reputation	
	Estimate	*(t-statistic)*	*Estimate*	*(t-statistic)*	*Estimate*	*(t-statistic)*
CONSTANT	–13.00**	–36.0	–20.87**	–30.8	–6.238**	–15.9
Log(WSP)	3.655**	45.0	5.436**	35.8	2.124**	23.9
Low-Quality Brand	–0.117**	–17.8			–0.107**	–15.7
High-Quality Brand	0.282**	41.1	0.181**	24.2		
Age	0.222**	70.8	0.196**	41.6	0.235**	56.5
Value Designation	–0.517**	–48.2	–0.569**	–40.8	–0.424**	–26.1
Collectibles/ Cellaring	0.740**	16.7	0.613**	13.4	1.012**	9.8
Specialty Wine	1.024**	27.7	0.968**	21.1	1.066**	18.6
Napa	–0.079**	–5.6	–0.071**	–3.7	–0.068**	–3.4
Sonoma	–0.336**	–26.4	–0.343**	–20.3	–0.320**	–16.9
Carneros	–0.258**	–15.2	–0.259**	–11.2	–0.263**	–10.8
Bay Area/Central Coast	–0.381**	–19.0	–0.336**	–13.3	–0.423**	–13.5
South Coast	–0.364**	–25.4	–0.360**	–19.6	–0.361**	–16.5
Rest of California	–0.764**	–48.8	–0.659**	–31.4	–0.876**	–36.8
Oregon	–0.510**	–36.0	–0.497**	–28.1	–0.524**	–23.4
Washington	–0.553**	–34.6	–0.454**	–21.7	–0.650**	–28.5
Rest of North America	–0.597**	–35.9	–0.597**	–26.0	–0.558**	–23.5
Argentina/Uruguay	–0.777**	–38.4	–0.731**	–23.3	–0.828**	–32.8

(Continued)

Table 4a (continued)

Parameter	All Wines		+ Brand Reputation		− Brand Reputation	
	Estimate	(t-statistic)	Estimate	(t-statistic)	Estimate	(t-statistic)
Chile	−0.885**	−56.5	−0.852**	−38.9	−0.928**	−42.7
Australia	−0.579**	−42.0	−0.536**	−28.9	−0.624**	−30.6
New Zealand	−0.408**	−27.1	−0.467**	−23.3	−0.345**	−15.3
South Africa	−0.685**	−42.3	−0.666**	−30.0	−0.706**	−30.3
Bordeaux	−0.405**	−16.3	−0.246**	−7.3	−0.634**	−19.9
Rhone	−0.180**	−9.0	−0.111**	−4.0	−0.240**	−8.5
Languedoc-Rous-sillon	−0.994**	−55.3	−0.978**	−38.7	−0.980**	−38.8
Rest of France	−0.509**	−32.4	−0.445**	−19.9	−0.565**	−25.7
Tuscany	−0.179**	−8.9	−0.147**	−5.6	−0.234**	−7.9
Piedmont	−0.142**	−8.3	−0.122**	−5.0	−0.141**	−6.0
Northern Italy	−0.611**	−36.8	−0.549**	−23.8	−0.669**	−28.7
Rest of Italy	−0.584**	−27.6	−0.558**	−20.0	−0.598**	−19.3
Germany	−0.272**	−12.9	−0.285**	−10.6	−0.245**	−7.5
Austria	−0.219**	−11.0	−0.200**	−7.5	−0.241**	−8.4
Spain	−0.676**	−35.2	−0.510**	−17.9	−0.805**	−31.5
Rest of World	−0.793**	−33.2	−0.790**	−24.7	−0.776**	−22.0
Cabernet Blends	−0.140**	−9.0	−0.129**	−6.3	−0.155**	−6.4
Cabernet Sauvignon	−0.165**	−13.4	−0.135**	−7.7	−0.205**	−11.9
Merlot	−0.278**	−21.6	−0.235**	−12.3	−0.324**	−18.4
Sangiovese	−0.428**	−21.9	−0.405**	−15.4	−0.419**	−14.8
Shiraz	−0.154**	−13.0	−0.158**	−10.3	−0.177**	−9.7
Zinfandel	−0.256**	−17.5	−0.245**	−12.2	−0.278**	−13.5
Other Red	−0.308**	−24.6	−0.295**	−16.6	−0.317**	−17.7
Red Blend	−0.287**	−20.7	−0.278**	−14.9	−0.309**	−14.6
Chardonnay	−0.269**	−28.0	−0.249**	−19.9	−0.287**	−19.4
Riesling	−0.306**	−18.0	−0.303**	−14.2	−0.352**	−12.8
Sauvignon Blanc	−0.347**	−28.7	−0.351**	−21.3	−0.348**	−19.6
Pinot Gris	−0.249**	−15.3	−0.216**	−9.0	−0.297**	−13.8
Viognier	−0.073**	−3.2	−0.091**	−3.1	−0.049	−1.5
Other White	−0.351**	−25.8	−0.375**	−20.0	−0.339**	−17.3
White Blend	−0.258**	−14.9	−0.215**	−8.3	−0.295**	−13.0
Adj. R^2 [%]	59.53		58.96		55.70	
F-Ratio	1197.3	(n = 39,041)	627.8	(n = 20,510)	494.2	(n = 18,531)

[†] Least Squares with White Heteroskedasticity-Consistent Standard Errors & Covariance

All estimates are significant at the 1% (**) or 5% (*) level.

Table 4b
Regression Results for vintages 2000–2003 [dep. variable = log(Price)]†

Parameter	All Wines		+ Brand Reputation		– Brand Reputation	
	Estimate	(t-statistic)	Estimate	(t-statistic)	Estimate	(t-statistic)
CONSTANT	–13.99**	–35.6	–23.20**	–36.3	–6.429**	–20.4
Log(WSP)	3.880**	44.0	5.961**	41.6	2.165**	30.5
Low-Quality Brand	–0.105**	–15.6			–0.095**	–13.7
High-Quality Brand	0.309**	42.8	0.195**	25.0		
Age	0.227**	67.3	0.201**	39.3	0.238**	54.0
Value Designation	–0.513**	–47.9	–0.560**	–40.7	–0.418**	–17.6
Collectibles/ Cellaring	0.774**	14.0	0.620**	11.5	1.207**	6.3
Specialty Wine	1.034**	26.1	1.012**	21.1	0.960**	22.4
Napa	–0.079**	–5.3	–0.090**	–4.3	–0.064**	–3.4
Sonoma	–0.351**	–26.5	–0.371**	–21.1	–0.325**	–17.5
Carneros	–0.282**	–16.2	–0.310**	–12.5	–0.267**	–9.1
Bay Area/Central Coast	–0.406**	–19.9	–0.374**	–15.3	–0.415**	–14.9
South Coast	–0.369**	–25.1	–0.377**	–19.7	–0.359**	–16.6
Rest of California	–0.776**	–46.9	–0.666**	–30.1	–0.856**	–39.3
Oregon	–0.516**	–34.6	–0.534**	–28.5	–0.490**	–22.7
Washington	–0.565**	–35.1	–0.529**	–25.1	–0.637**	–28.6
Rest of North America	–0.624**	–34.4	–0.660**	–27.0	–0.558**	–23.0
Argentina/Uruguay	–0.795**	–40.4	–0.797**	–28.4	–0.809**	–31.1
Chile	–0.898**	–56.3	–0.879**	–39.9	–0.937**	–39.9
Australia	–0.593**	–41.8	–0.556**	–29.0	–0.642**	–35.0
New Zealand	–0.418**	–26.8	–0.473**	–22.2	–0.368**	–15.5
South Africa	–0.708**	–43.5	–0.708**	–32.6	–0.713**	–30.1
Bordeaux	–0.450**	–19.4	–0.331**	–10.2	–0.617**	–23.4
Rhone	–0.282**	–14.6	–0.225**	–8.6	–0.354**	–15.1
Languedoc-Roussillon	–0.982**	–52.7	–0.976**	–36.3	–0.977**	–37.4
Rest of France	–0.546**	–33.8	–0.529**	–22.4	–0.567**	–26.5
Tuscany	–0.191**	–9.5	–0.186**	–7.0	–0.217**	–7.8
Piedmont	–0.230**	–13.2	–0.190**	–7.6	–0.251**	–11.1
Northern Italy	–0.639**	–37.0	–0.628**	–26.1	–0.645**	–26.2
Rest of Italy	–0.609**	–30.1	–0.562**	–20.7	–0.657**	–25.8
Germany	–0.250**	–11.8	–0.319**	–11.6	–0.189**	–6.0
Austria	–0.244**	–12.3	–0.244**	–8.7	–0.258**	–9.7
Spain	–0.660**	–34.1	–0.479**	–16.4	–0.804**	–36.2
Rest of World	–0.797**	–33.5	–0.834**	–25.0	–0.765**	–27.8

(Continued)

Table 4b (continued)

Parameter	All Wines		+ Brand Reputation		– Brand Reputation	
	Estimate	(t-statistic)	Estimate	(t-statistic)	Estimate	(t-statistic)
Cabernet Blends	–0.135**	–8.4	–0.111**	–5.2	–0.154**	–7.2
Cabernet Sauvignon	–0.143**	–10.8	–0.109**	–5.8	–0.181**	–10.2
Merlot	–0.270**	–19.5	–0.207**	–10.1	–0.323**	–16.7
Sangiovese	–0.425**	–21.7	–0.408**	–15.5	–0.415**	–14.6
Shiraz	–0.140**	–11.9	–0.139**	–9.2	–0.172**	–9.8
Zinfandel	–0.228**	–14.4	–0.236**	–10.8	–0.243**	–10.4
Other Red	–0.278**	–21.9	–0.262**	–14.7	–0.290**	–16.1
Red Blend	–0.249**	–17.8	–0.236**	–12.4	–0.261**	–14.0
Chardonnay	–0.253**	–25.7	–0.218**	–16.8	–0.280**	–20.5
Riesling	–0.284**	–16.6	–0.265**	–12.0	–0.329**	–12.2
Sauvignon Blanc	–0.317**	–25.4	–0.328**	–18.6	–0.308**	–16.4
Pinot Gris	–0.219**	–12.8	–0.173**	–6.7	–0.270**	–10.5
Viognier	–0.046*	–2.0	–0.068*	–2.2	–0.042	–1.2
Other White	–0.321**	–23.2	–0.326**	–16.7	–0.313**	–15.7
White Blend	–0.246**	–14.6	–0.213**	–8.5	–0.264**	–11.8
Adj. R^2 [%]	59.00		58.39		53.50	
F-Ratio	1060.8	(n = 38,685)	604.5	(n = 20,216)	452.5	(n = 18,469)

† Least Squares with White Heteroskedasticity-Consistent Standard Errors & Covariance

All estimates are significant at the 1% ** or 5% * level.

Table 4c
Regression Results for Vintages 2001–2004 [dep. variable = log(Price)]†

Parameter	All Wines		+ Brand Reputation		– Brand Reputation	
	Estimate	(t-statistic)	Estimate	(t-statistic)	Estimate	(t-statistic)
CONSTANT	–14.28**	–33.5	–26.06**	–42.9	–5.641**	–12.5
Log(WSP)	3.944**	41.2	6.608**	48.6	1.981**	19.4
Low-Quality Brand	–0.125**	–18.2			–0.126**	–17.3
High-Quality Brand	0.296**	40.7	0.171**	22.7		
Age	0.234**	60.0	0.202**	35.2	0.241**	48.2
Value Designation	–0.518**	–43.0	–0.575**	–35.0	–0.398**	–22.9
Collectibles/Cellaring	0.801**	10.8	0.605**	8.1	1.367**	7.6
Specialty Wine	1.138**	27.6	1.050**	21.5	1.183**	16.9
Napa	–0.091**	–5.7	–0.130**	–5.9	–0.059**	–2.7
Sonoma	–0.329**	–24.4	–0.379**	–21.4	–0.292**	–14.5
Carneros	–0.286**	–15.4	–0.323**	–11.7	–0.245**	–9.1
Bay Area/Central Coast	–0.403**	–18.8	–0.391**	–15.2	–0.407**	–12.2
South Coast	–0.376**	–25.1	–0.419**	–21.8	–0.329**	–14.8
Rest of California	–0.783**	–44.4	–0.680**	–28.8	–0.834**	–33.7

(Continued)

Table 4c (continued)

Parameter	All Wines		+ Brand Reputation		– Brand Reputation	
	Estimate	(t-statistic)	Estimate	(t-statistic)	Estimate	(t-statistic)
Oregon	–0.469**	–31.0	–0.513**	–28.1	–0.419**	–17.3
Washington	–0.587**	–35.1	–0.525**	–23.2	–0.654**	–28.4
Rest of North America	–0.619**	–31.5	–0.658**	–26.3	–0.514**	–18.9
Argentina/Uruguay	–0.792**	–39.2	–0.820**	–30.0	–0.785**	–28.7
Chile	–0.889**	–53.0	–0.852**	–36.8	–0.940**	–41.7
Australia	–0.592**	–39.6	–0.543**	–26.5	–0.640**	–30.6
New Zealand	–0.409**	–24.6	–0.524**	–23.6	–0.296**	–12.2
South Africa	–0.701**	–41.3	–0.706**	–31.6	–0.703**	–28.9
Bordeaux	–0.441**	–18.8	–0.351**	–10.7	–0.572**	–18.3
Rhone	–0.331**	–16.5	–0.281**	–10.8	–0.426**	–14.1
Languedoc–Roussillon	–0.961**	–50.0	–0.944**	–35.2	–0.963**	–38.2
Rest of France	–0.538**	–32.3	–0.566**	–24.4	–0.524**	–23.2
Tuscany	–0.223**	–10.5	–0.238**	–8.3	–0.203**	–6.7
Piedmont	–0.333**	–18.6	–0.298**	–11.6	–0.355**	–14.3
Northern Italy	–0.664**	–37.3	–0.639**	–25.5	–0.679**	–28.3
Rest of Italy	–0.642**	–31.7	–0.599**	–22.0	–0.670**	–23.3
Germany	–0.274**	–12.7	–0.378**	–13.5	–0.182**	–5.6
Austria	–0.267**	–13.8	–0.283**	–10.4	–0.268**	–10.2
Spain	–0.660**	–33.0	–0.495**	–16.4	–0.799**	–31.9
Rest of World	–0.789**	–31.3	–0.847**	–23.0	–0.732**	–22.7
Cabernet Blends	–0.136**	–8.0	–0.135**	–6.0	–0.111**	–4.4
Cabernet Sauvignon	–0.145**	–10.0	–0.125**	–6.3	–0.152**	–7.5
Merlot	–0.279**	–18.1	–0.243**	–10.5	–0.284**	–13.9
Sangiovese	–0.416**	–19.8	–0.415**	–14.4	–0.394**	–13.4
Shiraz	–0.122**	–10.2	–0.144**	–9.4	–0.114**	–6.0
Zinfandel	–0.199**	–11.9	–0.216**	–8.4	–0.174**	–7.7
Other Red	–0.250**	–18.8	–0.240**	–12.9	–0.238**	–12.9
Red Blend	–0.217**	–15.1	–0.220**	–11.5	–0.191**	–8.8
Chardonnay	–0.227**	–22.4	–0.204**	–15.5	–0.215**	–13.7
Riesling	–0.242**	–13.9	–0.229**	–10.1	–0.255**	–9.4
Sauvignon Blanc	–0.313**	–23.9	–0.333**	–18.1	–0.277**	–15.0
Pinot Gris	–0.182**	–9.7	–0.112**	–3.9	–0.218**	–9.4
Viognier	–0.026	–1.0	–0.073*	–2.1	0.007	0.21
Other White	–0.299**	–21.4	–0.321**	–16.4	–0.260**	–13.2
White Blend	–0.237**	–13.8	–0.215**	–8.6	–0.225**	–9.7
Adj. R^2 [%]	58.24		57.85		51.63	
F-Ratio	1045.4	(n = 35,943)	550.2	(n = 18,813)	388.8	(n = 17,130)

[†] Least Squares with White Heteroskedasticity-Consistent Standard Errors & Covariance

All estimates are significant at the 1% ** or 5% * level.

Cellar selections and collectibles (*CC*) receive a 74–80% premium while value designations (*BB*) carry a discount around 51%. A more detailed look at variety effects suggests that prices for all differentiated varietals are significantly different from the base variety, a Burgundy Pinot Noir. The estimated variety discounts vary from −14% (Cabernet Blends) up to −42% (Sangiovese). All these estimates are relatively stable over the three successive time-periods analyzed in the paper.

The most interesting results come from the relative effects of regional origin and the mitigating effects of brand reputation on wine prices. The estimated regional price differences are all negative relative to the Burgundy base region. Apart from "Rest of California", all other California regions receive higher prices relative to imports from the New World. New Zealand and Australia are the most successful New World importers. Oregon and Washington are about on par with Australia but exceed Chile, South Africa, and Argentina/Uruguay.

Next, we turn to the mitigating effects of brand reputation on the estimated regional effects. We argue that regional coefficients reflect both, a regional brand and a collective reputation value, because producer reputation signals are significant. Producers within a region may benefit from each other's quality performance due to spillover effects. As consumers pay closer attention to quality differences among producers, the price-quality relationship within a region becomes more competitive and less complementary. A higher level of regional quality would facilitate quality-based competition among producers and in turn may diminish the impact of regional promotion efforts.

The main objective of this paper was to empirically test whether brands with a positive reputation indicator rely less on their region's reputation and vice-versa. Since positive reputation brands produce wines which perform above their regional average and thus have a stronger brand reputation of their own, we expect that collective regional reputation is less important to consumers. On the other hand, since negative reputation brands perform below their regional average and thus have a weaker reputation of their own, we expect that collective regional reputation is more important to consumers. We estimate separate models for positive and negative reputation brands to test how regional reputation estimates differ *relative* to the full model. Based on our hypothesis, we expect that positive (negative) reputation brands show a negative (positive) difference *relative* to the full model.

Table 5 reveals that our hypothesis holds true for most of the regions examined during the vintage period 1999–2002. Significant exceptions are New Zealand and Germany (check columns 3 and 5 in Table 5 for large positive and negative numbers, respectively). For these regions, our model suggests that brands performing above the regional quality average still rely more on regional reputation than brands performing below the regional quality average. Thus, producers with a positive brand reputation have some catching up to do in terms of building a stronger *individual* reputation while producers with negative brand reputations are free-riding.

Table 5
Brand and Regional Reputation 1999–2002

	1	2	3	4	5
	Full Discount†%	*+ Brand Discount†%*	*Difference vs. Full Model %*	*– Brand Discount†%*	*Difference vs. Full Model %*
Napa	−7.9	−7.1	−0.82	−6.8	−1.03
Sonoma	−33.6	−34.3	0.74	−32.0	−1.62
Carneros	−25.8	−25.9	0.10	−26.3	0.50
Bay Area/Central Coast	−38.1	−33.6	−4.50	−42.3	4.25
South Coast	−36.4	−36.0	−0.38	−36.1	−0.30
Rest of California	−76.4	−65.9	−10.49	−87.6	11.21
Oregon	−51.0	−49.7	−1.27	−52.4	1.40
Washington	−55.3	−45.4	−9.84	−65.0	9.76
Rest of North America	−59.7	−59.7	−0.04	−55.8	−3.95
Argentina/Uruguay	−77.7	−73.1	−4.60	−82.8	5.06
Chile	−88.5	−85.2	−3.22	−92.8	4.38
Australia	−57.9	−53.6	−4.31	−62.4	4.49
New Zealand	−40.8	−46.7	5.87	−34.5	−6.38
South Africa	−68.5	−66.6	−1.96	−70.6	2.04
Bordeaux	−40.5	−24.6	−15.89	−63.4	22.94
Rhone	−18.0	−11.1	−6.91	−24.0	6.01
Languedoc–Roussillon	−99.4	−97.8	−1.61	−98.0	−1.36
Rest of France	−50.9	−44.5	−6.37	−56.5	5.61
Tuscany	−17.9	−14.7	−3.15	−23.4	5.55
Piedmont	−14.2	−12.2	−1.97	−14.1	−0.08
Northern Italy	−61.1	−54.9	−6.23	−66.9	5.77
Rest of Italy	−58.4	−55.8	−2.60	−59.8	1.41
Germany	−27.2	−28.5	1.31	−24.5	−2.71
Austria	−21.9	−20.0	−1.90	−24.1	2.24
Spain	−67.6	−51.0	−16.62	−80.5	12.87
Rest of World	−79.3	−79.0	−0.26	−77.6	−1.72
Wald-test F-statistic		6.85**		9.02**	

† Relative to base region/variety (Burgundy/Pinot Noir). ** Significance at 1% level.

In Table 6, we list the deviations versus the full model of strong brands (positive brands) and weak brands (negative brands) for all three vintage periods. In general, large negative numbers for positive brand reputations (and large positive numbers for negative brand reputations) indicate strong individual brands. Again, for Germany and New Zealand, positive reputation brands rely heavily on overall regional reputation. For Napa and Sonoma Valley, positive reputation brands are losing their strength and starting to rely on overall regional reputation. This particular effect is shown in Figure 1 with positive and negative brands moving in opposite directions. Regions where positive brands are holding on to

their individual reputations include the Rhone Valley, Spain and Bordeaux. This particular effect is shown in Figure 2 with positive and negative brands moving in the same direction.
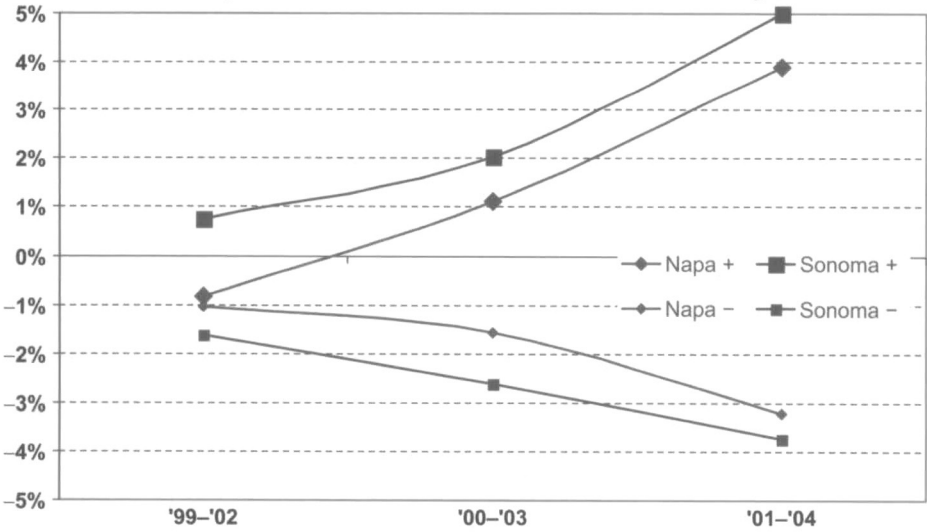
Table 6
Brand and Regional Reputation Over Time

Region	Positive Brand Reputations* %			Negative Brand Reputations* %		
	99–02	*00–03*	*01–04*	*99–02*	*00–03*	*01–04*
Rhone	−6.91	−5.67	−5.09	6.01	7.27	9.49
Languedoc–Roussillon	−1.61	−0.62	−1.73	−1.36	−0.54	0.18
Rest of World	−0.26	3.70	5.87	−1.72	−3.18	−5.73
Germany	1.31	6.88	10.47	−2.71	−6.18	−9.20
Rest of North America	−0.04	3.53	3.92	−3.95	−6.66	−10.46
Argentina/Uruguay	−4.60	0.20	2.79	5.06	1.32	−0.72
Australia	−4.31	−3.69	−4.86	4.49	4.90	4.77
Oregon	−1.27	1.75	4.43	1.40	−2.63	−4.95
Rest of France	−6.37	−1.77	2.82	5.61	2.04	−1.40
Chile	−3.22	−1.94	−3.75	4.38	3.88	5.01
Northern Italy	−6.23	−1.13	−2.49	5.77	0.61	1.53
Sonoma	0.74	2.04	5.04	−1.62	−2.60	−3.74
Washington	−9.84	−3.66	−6.24	9.76	7.19	6.71
South Coast	−0.38	0.84	4.33	−0.30	−0.97	−4.67
Spain	−16.62	−18.08	−16.57	12.87	14.43	13.86
Bay Area/Central Coast	−4.50	−3.27	−1.14	4.25	0.82	0.42
South Africa	−1.96	0.04	0.49	2.04	0.52	0.13
Rest of California	−10.49	−11.02	−10.34	11.21	8.00	5.06
New Zealand	5.87	5.48	11.47	−6.38	−5.03	−11.29
Carneros	0.10	2.78	3.73	0.50	−1.55	−4.13
Bordeaux	−15.89	−11.86	−9.05	22.94	16.71	13.08
Austria	−1.90	0.00	1.65	2.24	1.44	0.18
Tuscany	−3.15	−0.55	1.48	5.55	2.58	−2.00
Rest of Italy	−2.60	−4.67	−4.28	1.41	4.89	2.83
Napa	−0.82	1.11	3.89	−1.03	−1.56	−3.22
Piedmont	−1.97	−3.96	−3.55	−0.08	2.12	2.14

* Differences versus full model relative to base region/variety.

Finally we note that brand reputation effects have a similar interpretation when it comes to explaining the age premium. As expected, wine prices for the full samples increase with age (+22.2 to +23.4%). However, it is interesting to note that the age premium is always larger for negative reputation brands even though their wines are about 0.135 years younger on average. Since positive reputation brands perform above their regional average and have a stronger brand reputation of their own, we observe that the age of their wine is less important to consumers and results in a lower premium. On the other hand, since negative reputation brands perform below their regional average and have a weaker reputation of their own, we observe that the age of their wine is more important to consumers and results in a higher premium.

Figure 1
Brand Reputation Premium vs. Full Model for California Regions

Percentage price premia for positive and negative reputation brands as derived from Table 6

Figure 2
Brand Reputation Premium vs. Full Model for European Regions
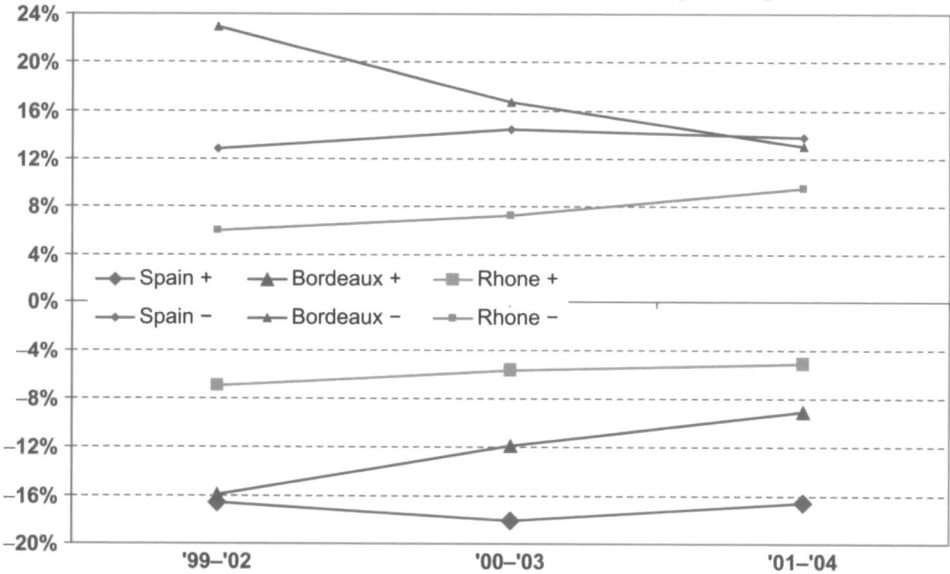
Percentage price premia for positive and negative reputation brands as derived from Table 6

V. Summary and Conclusion

Producer brands increasingly dominate the international food and beverage markets. In this respect, we argue that one cannot interpret regional reputation as a "regional brand" value (as opposed to a quality premium) without adjusting for brand reputation. Using a hedonic model, we analyze price and product quality indicators for 27 different wine regions. We calculate *regional reputation* indicators based on their relative quality performance through time for three vintage periods in order to examine how different regions have performed over time. We also define positive and negative *brand reputation* based on the quality performance relative to the regional average.

We then investigate the hypothesis that producer brands with a positive quality reputation depend less on their region's reputation and rely more on their own strengths and tested whether this proposition holds over a period covering six recent vintages. Our hedonic model largely confirms this hypotheses, but it also suggests that for some regions (Germany and New Zealand), producers with positive brand reputations rely heavily on their regional reputation while producers with negative brand reputations enjoy a free-ride. In other regions (including Napa and Sonoma Valley), high reputation brands are losing their strength and start to rely on overall regional reputation. Regions holding their individual brand reputations include the Rhone Valley, Spain, and Bordeaux.

Our analysis sheds some light on how regional and producer brands are performing as international wine markets mature in terms of global branding and consumers becoming more knowledgeable about wine regions, wine quality, and producer reputation. As wine consumers become aware of producers (brands) or sub-regional quality and reputation indicators, they will pay more attention to producer and site-specific quality signals and become less reliant on more diffuse signals, such as regional reputation. Then, the producers in regions with strong individual brand reputations are better suited to meet an increasingly discerning consumer demand in maturing market. Producers in regions relying on their overall regional reputation continue to count on less discerning consumers reliant on more diffuse quality signals in a less mature market environment. Targeting the right markets depending on the status of brand development may be a key to success for regional promotion efforts.

References

Anderson, K. and Wood, D. (2006). What determines the future value of an icon wine? New evidence from Australia. *Journal of Wine Economics*, 1(2), 141–161.

Arguea, N. and Hsiao, C. (1993). Econometric issues of estimating hedonic price functions. *Journal of Econometrics*, 56, 243–267.

Arrow, K. (1974). *The Limits of Organization*. New York: Norton.

Brooks, E. (2001). Countries as brands: international trade in wine. *Working Paper, Harvard University*. Presented at Oenometrics VDQS XIII in Napa Valley, CA.

Combris, P., Lecocq, S. and Visser, M. (1997). Estimation of a hedonic price equation for Bordeaux wine: does quality matter? *The Economic Journal*, 107, 390–402.

Diamond, D. (1989). Reputation acquisition in debt markets. *Journal of Political Economy*, 97 (4), 828–862.

Gokcekus, O. and Fargnoli, A. (2007). Is globalization good for wine drinkers in the United States? *Journal of Wine Economics*, 2(2), 187–195.

Haeger, J. and Storchmann, K. (2006). Prices of American Pinot Noir wines: climate, craftsmanship, critics. *Agricultural Economics*, 35, 67–78.

Holmström, B. (1982). Managerial incentive problems: a dynamic perspective. Republished in *Review of Economic Studies*, 66 (1999), 169–182.

Jones, G. and Storchmann, K. (2001). Wine market prices and investment under uncertainty: an econometric model for Bordeaux Crus Classés. *Agricultural Economics*, 26, 115–133.

Klein, B. and Leffler, K. (1981). The role of market forces in assuring contractual performance. *Journal of Political Economy*, 89(4), 615–641.

Landon, S. and Smith, C.E. (1998). Quality expectations, reputation and price. *Southern Economic Journal*, 64(3), 628–647.

Oczkowski, E. (2001). Hedonic wine price functions and measurement error. *The Economic Record*, 77(239), 374–382.

Ramirez, C. (2008). Wine quality, wine prices, and the weather: is Napa "different"? *Journal of Wine Economics*, 3(2), 114–131.

Rosen, S. (1974). Hedonic prices and implicit markets: product differentiation in pure competition. *Journal of Political Economy*, 82, 34–55.

Schamel, G. (2000). Individual and collective reputation indicators of wine quality. *CIES Discussion Paper* 0009. Centre for International Economic Studies, Adelaide University.

Schamel, G. (2006). Geography versus brands in a global wine market. *Agribusiness: An International Journal*, 22(3), 363–374.

Schamel, G. and Anderson, K. (2003). Wine quality and varietal, regional and winery reputations: hedonic prices for Australia and New Zealand. *The Economic Record*, 79(246), 357–369.

Shapiro, C. (1983). Premiums for high quality products as returns to reputations. *Quarterly Journal of Economics*, 98, 659–679.

Simon, H.A. (1997). *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organizations*, 4th Edition. New York: Free Press.

Tirole, J. (1996). A theory of collective reputations (with applications to the persistence of corruption and to firm quality). *Review of Economic Studies*, 63, 1–22.

Wine Spectator. (2005). New York: Wine Spectator Press. (http://www.wine-spectator.com)

Winfree, J. and McCluskey, J. (2005). Collective reputation and quality. *American Journal of Agricultural Economics*, 87(1), 206–213.