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A Dynamic Analysis of Regional and Producer Reputation for California Wine

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Abstract:
We hypothesize that quality signals improve over time with the quality performance of a wine producer, and that spillovers will affect other producers within the same region. For this purpose, we estimate a hedonic pricing model for premium California wine. Data source is the annual publication "California Wine Winners" accumulated over the judging years 1990-2001. Quality indicators for 19,583 wines are medals awarded during nine annual wine competitions, variety, regional origin, judging age as well as derived producer (brand) and regional reputation indicators. The data confirms that a wine's price is related to its own quality and to producer/regional reputation for quality.

Key words: wine, consumer economics, regional and producer reputation
JEL codes: L66, D83, Q18

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Introduction

Premium wine is a highly differentiated good with numerous quality aspects. An objective overall measure is difficult to define. Many *sensory* quality indicators that determine expert ratings are highly subjective. Additional indicators, such as labeling, bottle design, or the reputation of producers and regions may also advance or hinder the sale of a particular wine. Frequently, it is observed that wine prices may vary substantially despite very similar sensory quality attributes. For instance, wine from California's Napa Valley typically sells at a higher price than wine of comparable sensory quality from other regions. Quality signals are important price determinants for an experience good such as premium wine. We attempt to explain such observations by positing that the decision to buy a particular bottle of wine is affected by reputation indicators, variety, and regional origin. Moreover, given the limited attention that consumers can expend, all signals do not receive equal attention. We argue that the level of attention paid to quality signals increases with the historical quality performance of producers, and due to spillovers with those of associated producers within the same region. Because consumers are uncertain or do not have sufficient information about the overall quality, they are prepared to pay a much higher price for a reputable wine from a well-known region and/or producer.

Main objective of the paper is to estimate a hedonic model evaluating the impact of awarded medals, regional origin, wine variety, judging age, and in particular producer and regional reputation indicators on wine prices. Wine is an experience good with defining quality attributes. Producers and consumers evaluate these quality attributes. The observed market price is the sum of implicit prices paid for each quality attribute. Our data source is the annual publication "California Wine Winners" for the judging years 1990-2001 (Devine, 2001). It records sensory quality ratings expressed through award medals from nine annual wine competitions including the California State Fair, the West Coast Competition, and New World International where Gold, Silver and Bronze medals as well as Special Awards are granted. From these medal winnings we derive an index of both producer and regional reputation based on the cumulative medal awards up to and including the judging year for the wine. Modeling a unique regional reputation indicator in addition to a categorical regional origin dummy variable is a distinct feature of this empirical application.

Literature Review

A number of studies apply hedonic price analysis to estimate implicit prices for wine quality attributes. They are based on the hypothesis that any product represents a bundle of characteristics that define quality. Theoretical foundation is the seminal paper by Rosen (1974), which posits that goods are valued for their utility-generating attributes. Rosen suggests there are competitive implicit markets that define implicit prices for embodied product attributes, and that consumers evaluate product attributes (e.g. features of a car, indicators of air or water quality) when making a purchasing decision. The observed market price is the sum of implicit prices paid for each quality attribute. Rosen also recognizes an identification problem for supply and

demand functions derived from hedonic price functions, because implicit prices are equilibrium prices jointly determined by supply and demand conditions. Hence, implicit prices may reflect not only consumer preferences but also factors that determine production. In order to solve the identification problem it is necessary to separate supply and demand conditions. Arguea and Hsiao (1993) argue that the identification problem is essentially a data issue that can be avoided by pooling cross-section and time-series data specific to a particular side of the market.

Since the quality of a bottle of wine is not known until it is de-corked, its reputation affects consumer willingness to pay. In addition to sensory quality and variety, individual producer reputation, the collective reputation of wine regions also affects prices. Shapiro (1983) presents a theoretical framework to examine the effects of individual producer reputation on prices. He develops an equilibrium price-quality schedule, assuming competitive markets and imperfect consumer information. For consumers, it is costly to improve their information about product quality. He demonstrates that reputation allows high-quality producers to sell their items at a premium that may be interpreted as return on investments in reputation building. In such an environment of imperfect information, learning about the reputation of a product can be an effective way for consumers to reduce their decision-making costs. Noticing cumulative medal winnings for producers and/or regions may be an effective way for consumers to learn about reputation. Tirole (1996) presents a model of collective reputation as an aggregate of individual reputations where current producer incentives are affected by their own actions as well as collective actions of the past. He derives the existence of stereotype producers from history dependence, shows that new producers may suffer from past mistakes of older producers for a long time after the latter disappear, and derives conditions under which the collective reputation can be regained.

Nerlove (1995) examines the Swedish wine market having no domestic production, a small share of global consumption, and government controlled prices. This allows to assume exogenous prices (as opposed to assuming exogenous supply) and to estimate a reduced form hedonic price function, regressing quantities sold on various quality attributes and prices. Thus, Nerlove assumes that Swedish wine consumers express their valuation for a particular quality attribute by varying the derived hedonic demand for it. Golan and Shalit (1993) identify and evaluate quality characteristics for wine grapes from Israel. They analyze hedonic grape pricing of the input supply side of the wine market. They posit that high-quality wines are produced only when growers are given strong price incentives to supply better grapes. In a two-stage model, they first develop a quality index by evaluating the (relative) contributions of various physical grape attributes to wine quality. Second, they construct a quality-price function relating the price of Californian wine to the quality index developed in the first stage. Analogous to Nerlove, they also assume that prices are exogenous.

Combris, Lecocq and Visser (1997) estimate a hedonic price equation and what is referred to as a jury grade equation for Bordeaux wine to explain the variations in price and quality, respectively. Landon and Smith (1997, 1998) also present empirical analyses of Bordeaux wine, focusing on reputation indicators in addition to sensory quality attributes. In both papers, they study the impact of current quality as well as reputation indicators on consumer behavior using hedonic price functions. Lagged sensory quality ratings define individual product reputation. Regional reputation indicators are government and industry classifications. In addition, their 1997 paper analyzes five individual vintages over the period 1987 to 1991. Their

main conclusions are: reputation indicators have a large impact on consumer willingness to pay; an established reputation is considerably more important than short-term quality improvements; and ignoring reputation indicators will overstate the impact of current quality on consumer behavior. Their estimated coefficients vary substantially across the five vintages examined.

Oczkowski (1994) estimates hedonic price function for premium Australian wines, examining six attribute groups and various interaction terms. In another paper, he 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 (Oczkowski, 2001).

Schamel (2000) estimates a hedonic model with sensory quality ratings and individual as well as regional indicators for a white and a red variety (Cabernet Sauvignon and Chardonnay). The paper examines seven regions (Napa and Sonoma Valley, Sonoma County, Oregon, Washington State, Australia, Chile, South Africa). Although it includes observations from various vintages, it does not examine them individually. The estimated price elasticity of sensory quality is larger for white wine, indicating that consumers were willing to pay a higher quality premium for white compared to red wine. However, the results suggest both regional reputation and individual quality indicators seem to be more important to U.S. consumers of red wine. The results also suggest the public-good value of a regional appellation is higher for red wine regions and that individual producers in those regions may benefit more from collective marketing efforts. In another paper, Schamel evaluates a hedonic model for German wine based on quality evaluations from official agricultural society tasting. Schamel and Anderson (2001) evaluate wine quality and regional reputation indicators for Australia and New Zealand. Roberts and Reagans (2001) examine market experience, consumer attention, and price-quality relationships for New World wines in the U.S. market. They argue that producer or regional quality signals improve with the duration of market exposure and evaluation by consumers.

In this paper, we focus on reputation indicators in the form of cumulative quality evaluations. Consumers are uncertain about wine quality and use a reputation assessment in addition to quality perceptions about grape varieties and growing regions when forming their buying decisions. Their willingness to pay depends on cumulative quality evaluations for a particular wine, its producer, and its origin, as well as their own quality assessment for grape variety and growing region expressed through dummy variable premiums/discounts relative to a base variety/region. We analyze such quality and reputation indicators for premium wines from California. The annual publication *California Wine Winners* (Devine, 2001) records expert quality ratings expressed through award medals from nine annual wine competitions including the California State Fair where Gold, Silver and Bronze medals as well as Special Awards are granted to wines submitted for judging. From these medal winnings we derive an index of both producer and regional reputation based on the cumulative medal winnings up to and including the judging year of a wine. Modeling producer and regional reputation as well as regional origin as separate indicators is a unique feature of this paper.

Data and Analysis

Building on the seminal work by Rosen (1974), we assume that the price of a particular food product i (Pw_i) as a function of its characteristics z_j:

(1) $$P_{w_i} = P_w(z_{i1}, ..., z_{ij}, ..., z_{in})$$

We estimate a hedonic model using a data set with which we are able to discern expert quality assessments for individual products as well as measurements for producer and regional reputation indicators. We found such a detailed data set for the California wine industry. The book *California Wine Winners* publishes expert quality evaluations decorating wines at nine different annual wine competitions (see Tables 1 and 2). The published expert evaluations are in the form of award certificates and their numerical equivalents. The total sum of the numerical equivalents for every award certificate (Bronze = 1, Silver = 3, Gold = 5, Double Gold or Special Awards = 7) is a measure of the reputation for an individual wine (*IndivRep*) in our model. Moreover, we derive cumulative numerical award equivalents, which include all award certificates received by each producer or region up to the judging year.[1] The cumulative numerical equivalent for a producer measures quality performance or producer reputation (*ProdRep*) while the cumulative numerical equivalent for a region measures regional quality performance or reputation (*RegRep*). The dependent variable in the model is the logarithm of the price in 1990 US$ [log(deflPrice)]. For this purpose, we deflate the prices reported in *California Wine Winners* by a consumer price index for alcoholic beverages.[2]

Other variables included in the model are the wine variety (a categorical dummy variable) and the judging age (*Age*) defined as the difference between judging year and vintage. Notice that the estimated regional influence will be twofold. First, the associated regional reputation indicators derived from the cumulative quality assessments by product experts during the wine tasting competitions (*RegRep*). Second, the price premium commanded by products from a specific region (regional dummy variables) after controlling for product characteristics such as age and variety. The full data set, which we analyzed, includes the judging years 1990 through 2001 and consisted of more than 25,000 observations. The sample size used for the estimation was reduced due to missing price, grape variety, or vintage data, but still amounts to a total of 19,583 observations.

Table 1 provides some key characteristics of the data set. The raw data set differentiates nine regions and 23 varieties or associated varieties including sparkling wines which we exclude from our analysis. For estimation purposes, we differentiate all nine regions but we regroup the varieties as described in the notes on Table 1. Cabernet Sauvignon is chosen as the base variety and the generic “California” appellation as the base region. Regional importance is determined by industry size with Napa and Sonoma Valley leading in terms of number of award winning wines. For the whole sample, the average total number of medals awarded is 2.648, ranging from 1 to 9 medals for a single wine. The average nominal price is $15.58 ($12.38 deflated). The average numerical quality rating is 6.296, ranging from 1 to 45. The average age of the wine when judged is about 2.5 years. The sample contains about 60% red varieties and 40% white varieties. Table 2 provides a list of the wine competitions and the respective judging years from which the data set is drawn.

[1] The competitions during a judging year start in February and end in late June. The annual book "*California Wine Winners*" is published during November.

[2] For the wines in our sample, the reported price is a producer suggested retail price at the time of judging. This list price may differ from actual transaction prices, as retail mark-ups and government taxes differ.

The paper addresses product reputation effects measured by cumulative evaluations of wine quality over time. This reflects the number of prior quality signals that a producer, or region has generated. In markets for experience goods, such expert evaluations direct consumers to a particular product or producer association. Although we employ the numerical equivalent measure of quality performance in the model, we also explored other avenues. We ran each model using cumulative medal counts, which would also reflect producer and regional quality performance. The two variables are highly correlated with a correlation coefficient of 0.86 and thus yield similar results. The control variables include a set of indicator variables for grape variety and regional origin as well as the age of the wine at the time of judging as we expect that longer aged wines should achieve higher prices. Moreover, we analyze the model over five different time horizons in order to see how the reputation indicators evolve over time.[3]

Although we use a mixed log-linear functional form, the results are robust to model specification. The core model estimated in this paper is:

$$(2)\ \log(P_i) = \alpha + \beta_1 \log(IndivRep_i) + \beta_2 \log(ProdRep_i) + \beta_3 \log(RegRep_i) + \gamma Age_i + \delta D_{i\,Reg} + \theta D_{i\,Var} + \varepsilon$$

where $\log(P_i)$ is the logarithm of the deflated price in 1990 US$. Given the specific functional form of equation (2), β_1 measures the price elasticity of the individual reputation indicator *IndivRep*, β_2 the price elasticity of the producer reputation indicator *ProdRep*, and β_3 the price elasticity of the regional reputation indicator *RegRep*. The coefficient γ for Age_i indicates the percentage premium paid for older wines while δ and θ measure price premiums/discounts for regional origin and variety, respectively. $D_{i\,Reg}$ and $D_{i\,Var}$ denote the dummy variable matrices for regional origin and variety and ε is the error term. Equation (2) estimates the vectors β_i, γ, δ, and θ (i =1, 2, 3) relative to the contribution of the base control variables (i.e. Cabernet Sauvignon for variety and California for regional origin).

Estimation Results

Tables 3 and 4 list the regression results from the three hedonic models over the five different time horizons. Model 1 estimates equation (2) without log(*ProdRep*) and log(*RegRep*). Model 2 adds producer reputation [log(*ProdRep*)] as an explanatory variable and Model 3 regional reputation [log(*RegRep*)] to estimate the full equation (2). In both cases, the estimates are highly significant and F-tests show that adding these variables will significantly improve the model fit. Thus, we are able to show that producer as well as regional price-quality signals are affecting consumers in their buying decisions.

As expected, wine prices will increase with age (a 7% premium) and are positively related to positive product evaluations (*IndivRep*), producer reputation (*ProdRep*) and regional reputation (*RegRep*). Figure 1 depicts the reputation elasticities over time frame of Model 3. Wines of higher quality, and those whose producers and/or regions have better quality performance command significantly higher prices. However, the price premiums are very small. For example, a 1% increase in the regional reputation indicator will only result in a 0.044% increase in prices for the most recent overall sample (Table 4). The relative contribution of the control variables for grape type and regional origin to prices is comparatively stable over time for all three models. However, the price premiums for variety and regional origin (dummy

[3] For example, the column for the judging year 2001 includes the complete set from all wine competitions between 1990 and 2001. The column for the judging year 1998 only includes the judging years 1990 through 1998.

indicators) are quite large, varying between -55% and + 40% for variety (relative to Cabernet Sauvignon) and between 18% and 55% for regional origin (relative to the generic California denominations). These results would indicate that although all three reputation indicators are significant, basic regional and varietal effects dominate.

If access to more proximate quality signals is difficult, consumers may rely on more imperfect (i.e. collective) signals in making their decisions (Tirole, 1996). A regional reputation indicator for quality may serve as such a signal (Landon and Stuart, 1997). In the current context, it would be reasonable to suggest that low levels of regional quality performance would also imply reduced access more to accurate quality signals. Therefore, collective reputation indicators should have an effect on price only when the regional quality performance is relatively low, but they would lose their impact when this performance improves.

Model 3 shows that the regional reputation effect is extremely small but positive. Over time, as producer and regional reputation accumulate, it seems that the sensitivity of price to product quality signals, as well as to producer reputation signals are relatively stable. However, the price elasticity due to the regional reputation indicator increases slightly over time although from a low level. A possible explanation for this increase may be as follows. While the California wine industry has a long history, recent growth in terms of new vineyard development has been tremendous. Many new producers have emerged and started to participate in wine competitions. The number of different producers in our sample increased from 289 in 1990 to 434 in 2001. Thus, consumers had to absorb a lot of new information on new producers and have, in the course of this development, again relied on less accurate regional reputation indicators. Thus, this market may still be at a stage where the level of producer quality performance is evolving and consumers tend to rely on the more diffuse quality signal. The very low elasticity for producer reputation (0.012% - 0.015%) and the large regional origin coefficients support this claim (see also Figure 2).

However, as producer quality performance accumulates, producer reputation should become more and regional reputation less important. As consumers pay closer attention to differences among products and producers, the quality performance relationship within a region becomes more competitive and less complementary. Regional producers benefit from each other's quality performance because of spillover effects. In turn, increased regional quality performance facilitates quality-based competition among producers. The overall relationship among associated producers is a combination of complementary and competitive forces.

We predict that quality signals improve with the historical quality performance of a wine producer, and that spillovers affect associated producers within the same region. Our analysis of California wine price-quality relationships strongly supports this position. Moreover, the data also confirms positive price effects from individual wine quality indicators such as medals won by a particular wine and judging age. Thus, a wine’s price is related to both its own quality, and to its producer’s reputation for quality. However, these relationships depend on the historical performance of both the producer, and other producers in the region. As producer reputation accumulates, consumers should pay more attention to individual producer-specific quality signals and become less reliant on more diffuse signals, such as regional quality indicators.

Discussion and Conclusion

At least three lessons can be drawn from these results. A first lesson is that independent quality assessments at wine competitions appear to have a significant positive impact on the prices that consumers are willing to pay for premium wines, even after correcting for grape varieties and regional origin. This is consistent with Schamel's (2000) study based on ratings published in *The Wine Spectator* and suggests consumers value this information in their quest for greater knowledge about available wines. However, the estimated coefficients for individual quality effects appear to be much smaller in the current context of quality assessments at wine competitions. The second lesson is that the premiums which consumers are willing to pay for reputation indicators are positive but small. This is consistent with wine consumers becoming more confident in their one ability to discern the quality of different wines, and hence less reliant on imperfect signals, such as regional reputation (Tirole, 1996).

The third lesson is the clear trend towards greater regional differentiation (see Figure 2) which also suggests that consumers are becoming more discerning. The difference in the degree of regional differentiation over time may simply reflect the rapid growth in the California wine industry during the 1990s. Another contributing factor may be the registration of regional names providing for stronger property rights and value in regional names, thereby raising the rates of return on investments in regional promotion. Even though they cannot say anything about the profitability of such investments, the above results are not inconsistent with the view that price premiums can be generated through such promotion. The Old World tradition of emphasizing regional origin would gradually take hold in the New World. It remains to be seen whether regional reputation indicators become more or less important over time. On the one hand, regions are investing more in generic promotion. On the other hand, globalization is causing individual wineries to agglomerate and put more emphasis on building a corporate brand reputation.

We estimate significant relative differences between wine varieties and growing regions, which warrant important marketing implications for individual producers as well as entire wine growing regions. Because regional reputation is a public good, it may be desirable to engage in activities to enhance the reputation of particular wine growing areas or of varieties from a region. Our results suggest that marketing regional origin as a quality attribute may have a higher payoff for regions growing primarily red wine which typically sell at higher prices. Moreover, for regions that primarily grow white wine it seems that a marketing strategy emphasizing regional origin may be less suitable and that producers in those regions should benefit more from individual marketing efforts.

Finally, we ought to mention some characteristic features of the California wine industry studied in this paper. It is probably save to say that consumer attention to wine quality evaluations is quite high, with several major publications providing wine quality ratings on a regular basis, not to mention the regional as well as variety ‘fashion’ trends in wine consumption that these publications may determine. Moreover, the quality of each vintage is affected by many factors beyond producer control. However, it would be intriguing to see whether the estimation results on reputation indicators hold for a food or beverage product other than wine. We are actively looking for an additional data set to study this.

Table 1: Characteristics of the Data Set

Regions [1]/ Varieties	Count	Freq.	Av. Price
Napa	3,735	19.07%	20.36
Sonoma	5,176	26.43%	16.84
Bay Area	620	3.17%	17.91
North Central	1,303	6.65%	13.72
North Coast	1,832	9.36%	14.07
Sierra Foothills	1,181	6.03%	13.47
South Central	2,076	10.60%	15.59
South Coast	426	2.18%	13.10
California [2]	3,234	16.51%	10.29
Cabernet Sauvignon [2]	3,623	18.50%	18.63
Zinfandel	2,054	10.49%	14.96
Merlot	1,816	9.27%	16.29
Pinot Noir	1,428	7.29%	18.54
Red Meritage	575	2.94%	28.48
White Zinfandel	430	2.20%	5.90
Syrah	534	2.73%	17.66
Petite Sirah	334	1.71%	14.27
Italian Reds [3]	452	2.31%	17.68
Other Reds [4]	500	2.55%	16.09
Chardonnay	3,845	19.63%	15.09
Sauvignon Blanc	1,512	7.72%	9.71
Riesling	613	3.13%	9.81
Gewürztraminer	450	2.30%	9.60
Chenin Blanc	304	1.55%	7.03
Other White [5]	1113	5.68%	14.86
All Red Varieties	11,746	59.98%	17.32
All White Varieties	7,837	40.02%	12.98
All Observations	**19,583**	**100.00%**	**15.582**
	Av.	**Min.**	**Max.**
Total Medal Number [6]	2.648	1	9
Numerical Equivalent [7]	6.296	1	45
Age [8]	2.521	0	16

Notes:

[1] Regions are defined as follows:

Napa	Napa County
Sonoma	Sonoma County
Bay Area	Alameda, Contra Costa, San Mateo, Santa Clara and Santa Cruz Co.
North Central	Monterey and San Benito Co.
North Coast	Lake, Mendocino, Marin and Solano Co.
Sierra Foothills	Amador, Calaveras, El Dorado, Mariposa, Nevada, Placer, Tuolomne, Yuba Co.
South Central	San Luis Obispo and Santa Barbara Co.
South Coast	Los Angeles, Orange, Riverside, San Diego and Ventura Co.
California	All other California counties and non-specified blends from above.

[2] Cabernet Sauvignon is base variety, California is base region

[3] Italian Reds include Sangiovese and other Red Italian Varietals.

[4] Other Reds include Cabernet Franc as well as other Bordeaux and Red Rhone Varietals.

[5] Other Whites include Semillon, Voignier, Pinot Blanc, White Dessert, White Varietals, and White Meritage.

[6] Medals awarded from competitions are Special Awards, Gold Medals, Silver Medals, and Bronze Medals or None.

[7] Numerical equivalents are 7 for Special Awards, 5 for Gold Medals, 3 for Silver Medals, 1 for Bronze Medals.

[8] Judging age defined as the difference between judging year and vintage.

Table 2: Wine Competitions

Judging Years	'90-'93	'94-'96	'97-'98	'99-'01
Los Angeles County Fair	X	X	X	X
Orange County Fair	X	X	X	X
Riverside Farmers Fair [1]	X	X	X	X
San Francisco Fair [2]	X	X	X	X
California State Fair	X	X	X	X
San Diego Competition	X	X	X	X
National Orange Show	X		X	X
West Coast Competition	X	X		X
Dallas Morning News	X	X	X	
New World International		X	X	X

[1] Riverside International beginning in 1999
[2] San Francisco International beginning in 1999

Table 3: Model 1 & 2 Results [dep. variable = log(deflPrice)]

	Model 1					Model 2				
Judging Year	**2001**	**2000**	**1999**	**1998**	**1997**	**2001**	**2000**	**1999**	**1998**	**1997**
CONSTANT	1.870	1.872	1.867	1.873	1.856	1.784	1.785	1.776	1.797	1.798
log(IndivRep)	0.0473	0.0494	0.0510	0.0468	0.0473	0.0358	0.0375	0.0386	0.0365	0.0396
log(ProdRep)						0.0219	0.0222	0.0236	0.0202	0.0155
Age	0.071	0.072	0.077	0.077	0.079	0.070	0.072	0.077	0.077	0.079
Zinfandel	-0.054	-0.070	-0.070	-0.082	-0.094	-0.054	-0.070	-0.070	-0.082	-0.093
Merlot	0.008*	0.020*	0.034	0.032	0.029	0.005	0.017	0.031	0.030	0.027
Pinot Noir	0.120	0.121	0.131	0.124	0.123	0.117	0.118	0.128	0.121	0.120
Red Meritage	0.412	0.415	0.420	0.427	0.427	0.409	0.411	0.415	0.422	0.423
White Zinfandel	-0.571	-0.565	-0.552	-0.549	-0.530	-0.572	-0.565	-0.551	-0.548	-0.529
Syrah	0.111	0.117	0.136	0.145	0.156	0.105	0.111	0.130	0.140	0.152
Petite Sirah	-0.104	-0.116	-0.126	-0.137	-0.148	-0.107	-0.118	-0.128	-0.138	-0.149
Italian Reds	0.098	0.113	0.145	0.149	0.188	0.096	0.111	0.141	0.144	0.183
Other Reds	0.002*	-0.003*	0.011*	0.022*	0.022*	-0.003	-0.007	0.007	0.019	0.022
Chardonnay	-0.010*	0.006*	0.026	0.030	0.043	-0.011	0.006	0.027	0.031	0.043
Sauvignon Blanc	-0.361	-0.355	-0.338	-0.336	-0.330	-0.365	-0.358	-0.340	-0.338	-0.331
Riesling	-0.322	-0.310	-0.284	-0.273	-0.250	-0.329	-0.316	-0.290	-0.279	-0.254
Gewurztraminer	-0.328	-0.321	-0.300	-0.294	-0.289	-0.336	-0.329	-0.308	-0.302	-0.294
Chenin Blanc	-0.561	-0.560	-0.544	-0.551	-0.542	-0.562	-0.560	-0.543	-0.549	-0.541
Other White	0.002*	0.014*	0.027*	0.023*	0.013*	-0.009	0.003	0.016	0.013	0.006
Napa	0.550	0.520	0.480	0.470	0.456	0.561	0.530	0.491	0.479	0.463
Sonoma	0.425	0.394	0.356	0.346	0.336	0.420	0.389	0.351	0.342	0.334
Bay Area	0.471	0.455	0.430	0.419	0.407	0.478	0.463	0.440	0.427	0.415
North Central	0.255	0.233	0.197	0.185	0.172	0.257	0.235	0.200	0.188	0.175
North Coast	0.308	0.291	0.260	0.253	0.252	0.299	0.282	0.250	0.245	0.246
Sierra Foothills	0.244	0.214	0.178	0.172	0.156	0.253	0.224	0.190	0.183	0.165
South Central	0.366	0.344	0.308	0.304	0.296	0.375	0.353	0.317	0.311	0.302
South Coast	0.218	0.206	0.192	0.169	0.128	0.224	0.210	0.197	0.175	0.132
adjusted-R^2 (%)	46.70	46.67	46.79	47.15	48.42	47.16	47.16	47.34	47.54	48.64
F-Statistic**						172.46	158.02	158.01	101.24	51.19

* NOT significant at the 5% level; all other variables are significant.
** F-Test versus Model 1.

Table 4: Regression Results [dep. variable = log(deflPrice)]

	Model 3				
Judging Year	**2001**	**2000**	**1999**	**1998**	**1997**
CONSTANT	1.425	1.444	1.437	1.505	1.663
log(IndivRep)	0.0389	0.0407	0.0428	0.0410	0.0419
log(ProdRep)	0.0122	0.0132	0.0148	0.0129	0.0120
log(RegRep)	0.0441	0.0420	0.0416	0.0359	0.0170
Age	0.074	0.075	0.081	0.080	0.080
Zinfandel	-0.057	-0.072	-0.071	-0.082	-0.093
Merlot	0.001*	0.015*	0.031	0.030	0.028
Pinot Noir	0.116	0.118	0.128	0.122	0.121
Red Meritage	0.406	0.409	0.413	0.421	0.423
White Zinfandel	-0.555	-0.548	-0.532	-0.532	-0.523
Syrah	0.088	0.094	0.115	0.127	0.146
Petite Sirah	-0.101	-0.112	-0.123	-0.134	-0.147
Italian Reds	0.071	0.086	0.115	0.122	0.172
Other Reds	-0.018*	-0.022*	-0.009*	0.005*	0.014*
Chardonnay	-0.006*	0.012*	0.033	0.037	0.046
Sauvignon Blanc	-0.352	-0.345	-0.328	-0.327	-0.327
Riesling	-0.306	-0.294	-0.268	-0.261	-0.247
Gewurztramier	-0.317	-0.310	-0.291	-0.287	-0.288
Chenin Blanc	-0.535	-0.534	-0.517	-0.527	-0.531
Other White	-0.017*	-0.004*	0.008*	0.006*	0.004*
Napa	0.547	0.517	0.477	0.466	0.456
Sonoma	0.389	0.359	0.322	0.316	0.320
Bay Area	0.553	0.536	0.514	0.491	0.444
North Central	0.295	0.274	0.241	0.223	0.191
North Coast	0.316	0.298	0.266	0.258	0.251
Sierra Foothills	0.303	0.275	0.243	0.228	0.187
South Central	0.387	0.365	0.330	0.322	0.306
South Coast	0.320	0.306	0.299	0.267	0.179
adjusted-R^2 (%)	47.66	47.58	47.72	47.82	48.99
F-Statistic**	186.72	140.60	109.85	72.19	13.95
N	19,583	17,291	15,044	13,489	11,474

* NOT significant at the 5% level; all other variables are significant.
** F-Test versus Model 2.

Figure 1: Reputation Elasticities

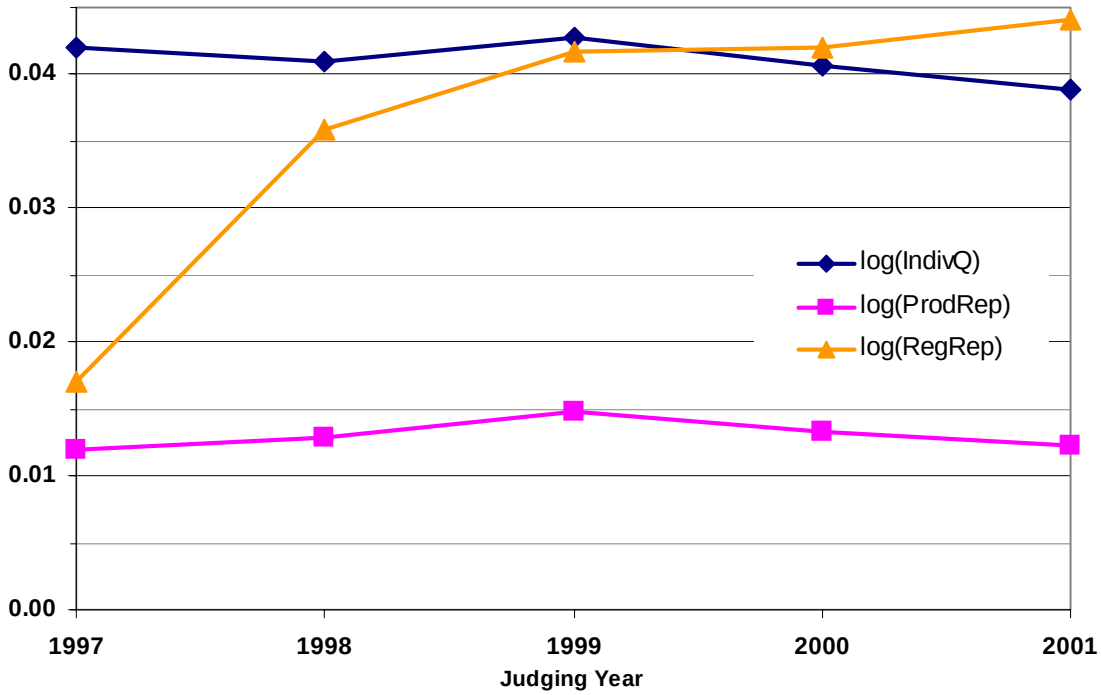
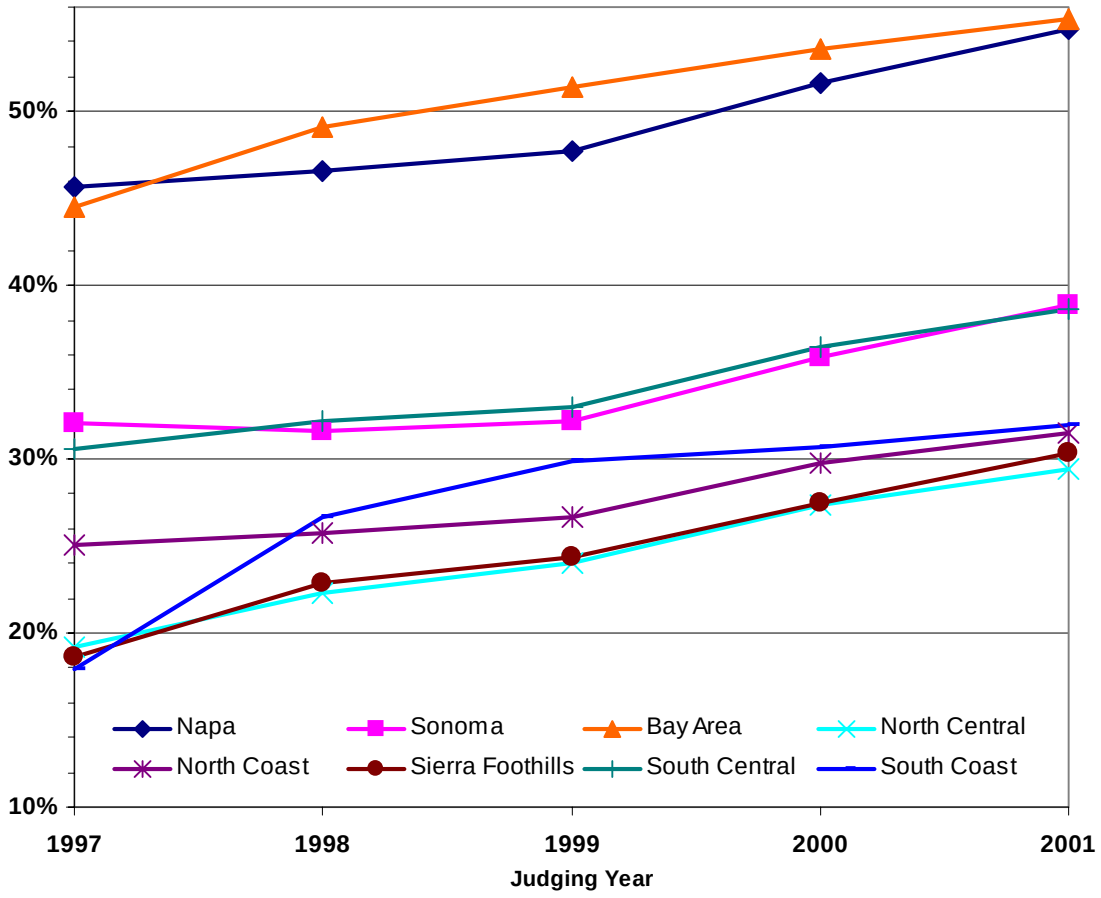


Figure 2: Regional Premiums



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