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The Demand for Expert Opinion: Bordeaux Wine*

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Abstract

In this paper, we use unique data from the market for Bordeaux wine to test the hypothesis that consumers are willing to pay for expert opinion because it is accurate. Using proprietary indicators of the quality of the vintage, which are based on both publicly and privately available information, we find that additional publicly available information on the weather improves the expert's predictions of subsequent prices. This establishes that the expert opinions are not efficient, in the sense that they can be easily improved, and that these opinions must be demanded, at least in part, for some purpose other than their accuracy. (JEL Classification: D8, Q13)

Keywords: expert opinion, market predictions, wine pricing.

I. Introduction

Consumer and producers decisions are increasingly determined by expert opinions. Computer equipment and software are purchased by professional purchasing agents, medicine and medical procedures are prescribed by doctors, stock portfolios are selected by mutual fund managers, students attend colleges based on the advice of guidance counselors, and Bordeaux wine is purchased (long before it is drinkable) on the advice of a wine expert. In each case, the key decision affects the final consumer, but the decision is made by a professional expert hired for the purpose who is removed from the consumer. What precisely is the nature of the demand for this expert opinion?

In this paper, we use unique data from the market for Bordeaux wine to test the hypothesis that consumers purchase expert opinion because it is accurate.

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Surprisingly, the evidence for this hypothesis is very weak in the markets where it has been examined. For example, it is well documented that index funds (which have no managers) outperform managed portfolios. Likewise, most studies of clinical opinions in psychology suggest that these opinions do not act as well as predictors of outcomes as do mechanical rules based on the same information. Even studies of the success of graduate students in economics (such as the one by Krueger and Wu, 1998) suggest that mechanical rules may outperform admission committees.

Bordeaux wine offers an extraordinary opportunity to study the role of expert opinion in purchasing behavior. The wines from the top châteaux (vineyards) are purchased before they are at their peak of drinkability. As a result, these wines are typically purchased before they are tasted and solely on the basis of expert opinion. Because the wines are traded in an active auction market after they have reached their peak drinkability, it is possible to obtain a potentially independent measure of the success of the expert opinions.

In this paper, we use a unique set of proprietary indicators of the quality of the vintage in Bordeaux prepared by consultants to 14 well-known (but not identifiable) châteaux and test the efficiency of these indicators as predictors of the prices that Bordeaux wines fetch at auction. These quality indicators are based on tasting the wine, but they are made by consultants who have access to complete details of the growing season that produced the wines and of chemical analyses of the grape juice and the resulting wines. The basic idea is to determine whether these indicators exhaust all the information available publicly for the purpose of predicting the subsequent quality of the vintage. If the expert's opinion is efficient, then no additional information available at the time of the expert's decision should provide a material improvement on the expert's prediction. If the expert's opinion is not efficient, in the sense that it can easily be improved, then it must be demanded, at least in part, for another purpose.

In the case of fine wine, it has been established that prices are related to the weather that produced the wines of the vintage (see Ashenfelter, Ashmore, and Lalonde, 1995; Byron and Ashenfelter, 1995; Di Laurea, 1996; and di Vittorio and Ginsburgh, 1994). It follows that one candidate set of information for testing the efficiency of expert opinions about wine will include the publicly available data on the weather. In this paper, we provide tests of whether the experts' opinion fully incorporates this information.

The results of our analysis show that the experts' ratings are not efficient in the prediction of prices and that they do not incorporate all the publicly available information. In addition, some evidence in the data suggests that part of the effect that the experts' opinion does have may be the result of self-fulfilling prophecies.

II. Data

A. Price and Weather Data

The data on the average price of the wines of each vintage and the weather have been described in Ashenfelter, Ashmore, and Lalonde (1995). Briefly, the weather data include the average temperature in centigrade degrees over the growing season April through September, the rainfall (in millimeters) toward the end of the growing season (summed over August and September), and the rainfall over the previous winter (from October through March). The average price of the wines of a vintage is an index based on the wines of several chateaux. The châteaux are deliberately selected to represent the most expensive wines (Lafite, Latour, Margaux, and Cheval Blanc) as well as a selection of wines that are less expensive (Ducru-Beaucaillou, Léoville Las Cases, Palmer, Pichon Lalande, Beychevelle, Cos d'Estournel, Giscours, Gruaud-Larose, and Lynch-Bages) but are traded in considerable volume in the auctions. These data are publicly reported from time to time in the journal *Liquid Assets: The International Guide to Fine Wines.*

We construct the index of a vintage's average price from a regression of the logarithm of the price from several thousand auction sales on dummy variables indicating the château and the vintages. The regression coefficients for the vintage dummies are then used to construct the vintage index. This provides a simple way to construct a vintage index in the presence of an unbalanced sample design.

B. Expert Ratings

The data on experts' opinion of quality were obtained from Professors Pascal Riberau-Gayon and G. Guimberteau (1997, personal communication). The professors are considered the foremost enologists in the Bordeaux region, and they act as viticultural consultants for some of the most respected châteaux. They have compiled data on the details of each growing season (including, but not limited to, the dates of the flowering, color change, and harvest of the grapevines) and a measure of the average quality of the vintage as compiled from 10 to 15 of the top vineyards. There is little doubt that the opinions formed by these experts are available in Bordeaux and used, in part, to form the basis for the marketing of the young wines.

III. Expert Ratings, Weather, and Prices

The basic results of the analysis of the vintage price index are shown in Table 1. The experts' rating takes the form of a numerical index with values from 1 to 7. Because it is not clear how this metric should be translated to prices, we have used a nonparametric form for the analyses that preserves all the information in the rating scale. We do this by creating a set of 7 dummy variables that take the value unity

Table 1
Determinants of the Logarithm of the Price Index for Bordeaux Wine (of 13 Châteaux) 1952–1980 (excluding 1954 and 1956)

	(1)	(2)	(3)	(4)	(5)
Age of wine	.026 (.008)	.024 (0.007)	0.019 (0.006)	0.021 (0.009)	0.019 (0.008)
Expert rating					
2	− .033 (.276)	—	− .103 (.174)	− .093 (.189)	—
3	.163 (.262)	—	− .138 (.191)	− .120 (.230)	—
4	.122 (.385)	—	− .625 (.276)	− .601 (.351)	
5	.629 (.251)	—	− .0345 (.230)	− .106 (.276)	
6	1.019 (.242)	—	.363 (.259)	—	.254 (.182)
7	1.476 (.275)	—	.703 (.304)	—	.558 (.254)
Avg. temp (C.) (Apr.–Sep.)		.619 (.094)	.281 (.130)	.257 (.197)	.278 (.243)
Harvest rain (mm.) (Aug.–Sept.)		–.0037 (.0008)	− 0.0034 (.0007)	− .0035 (.001)	− .0016 (.0016)
Winter Rain (mm.) (Oct.–Mar.)		.0012 (.0004)	.0010 (.0004)	.0009 (.0008)	.0016 (.0007)
Adj. R^2	.769	.800	.946	.542	.812
Sample	all	All	all	poor vintages	good vintages
F test (*p*-value)					
Expert opinion	.000		.002	.580	.152
Weather		.000	.000	.108	.036

(or zero) according to whether a vintage is placed in one of the 7 categories. We have arbitrarily omitted the dummy variable for category l, so all the remaining effects should be interpreted as relative to this lowest category.

The restriction of the experts' opinion to a scale that comprises only 8 possible values suggests that it may be possible that the experts have additional information that is not in the scale. Although this possibility cannot be ruled out, there is no reason why the scale would be restricted to only 8 possible values if additional information were available. The University of California at Davis has recommended a scale from 1 to 20 for grading wines, and most wine publications currently use a scale from 50 to 100. The fact that the experts at the University of Bordeaux have selected a scale from 1 to 7 suggests that this exhausts the information available to them, although this may not be the case.

Column 1 of Table 2 reports the basic regression results using the experts' ratings as variables in the regression determining price. In addition to the experts' ratings, the regression also includes a variable that measures the age of the vintage. Vintage ratings are taken in the year following the vintage, but the vintages on sale are not all the same age. The effect of the age of the wine on the proportionate price is a measure of the real rate of interest associated with the holding of fine wines. For Bordeaux wines, this rate of return has been measured at from zero to five percentage points over a considerable period by Wilder (1997), and it is estimated at around 2% in Table 2 in all the regressions reported.

Table 2
Determinants of the Experts' Quality Index 1953–1995

	(1)	*(2)*	*(3)*	*(4)*
Average temp. (C.) (Apr.–Sep.)	1.48 (.22)	1.59 (.25)	1.59 (.30)	1.67 (.33)
Harvest rain (mm.) (Aug.–Sep.)	−.011 (.003)	−.011 (.003)	−.012 (.003)	−.012 (0.003)
Winter rain (mm.) (Oct.–Mar.)	.0027 (.0014)	.0029 (.0014)	.0021 (.0013)	.0023 (.0013)
Year		−.015 (.017)		−.011 (.016)
Estimation method	Regression	Regression	Ordered Probit	Ordered Probit
Adj. R^2	.62	.61		

The regression in column 1 of Table 1 indicates that the experts' ratings are powerful predictors of the vintage price index. The explained variance in a regression that includes only the age of the vintage is only about 18%, so the addition of the experts' ratings is a considerable improvement. More formally, an *F*-test strongly rejects the hypothesis that the experts' ratings do not belong in the regression.

In general, if properly constructed, the prices would be expected to be a monotone function of the experts' numerical rating. Although the coefficients in column 1 do not strictly satisfy this requirement (rating 2 has a negative coefficient, while rating 4 has a coefficient less than rating 3), it seems unlikely that a formal test would reject this hypothesis.

Column 2 of Table 2 provides the regression of the same price index on the three weather variables that have been used extensively in studies of the determinants of wine quality. As the table indicates, these weather variables actually explain slightly more of the variance in prices than do the expert opinions.

Column 3 of Table 2 provides the critical test of the efficiency of the experts' ratings. As the *F*-test in the table indicates, the weather variables remain highly significant predictors when they are added to the regression. This indicates that the experts' opinion can be improved upon by incorporating into them further weather information. A comparison of the coefficients of the weather variables in columns 2 and 3 provides evidence on the source of the inefficiency. If the experts' ratings were efficient, the coefficients on these weather variables in column 3 would be zero. It is apparent that the coefficient on the average temperature is reduced considerably by the introduction of the experts' rating variables, but the coefficients of the other variables are hardly reduced at all. This suggests that the experts' rating does not rely heavily enough on either the rainfall at harvest or the rainfall in the previous winter.

These findings may come as no surprise to those familiar with the popular reporting on the vintage in Bordeaux. In popular reports, early harvest dates are discussed as key indicators of the quality of the wines, and it is well known that early

harvests result from warmer-than-normal growing seasons. It appears that this information is largely incorporated into the experts' opinions, but other less publicized determinants of the quality of the wines are not. It is also possible that the early tasting of the wines is overly influenced by the ripeness of the grapes (which is heavily determined by the average temperature during the growing season), but that later evaluations are not so heavily influenced by ripeness. Either way, however, efficient experts' ratings would incorporate these facts if they were correct.

What is surprising, however, is that in column 3 four of the six coefficients on the experts' ratings are inconsistent, with a monotone effect of higher ratings on prices. After the weather variables are included in the regression, it is only ratings in the top two categories that attract additional price increases. This might suggest that the relationship between the weather variables and the vintage price index is nonlinear, but other (unreported) regressions provide no evidence of this.

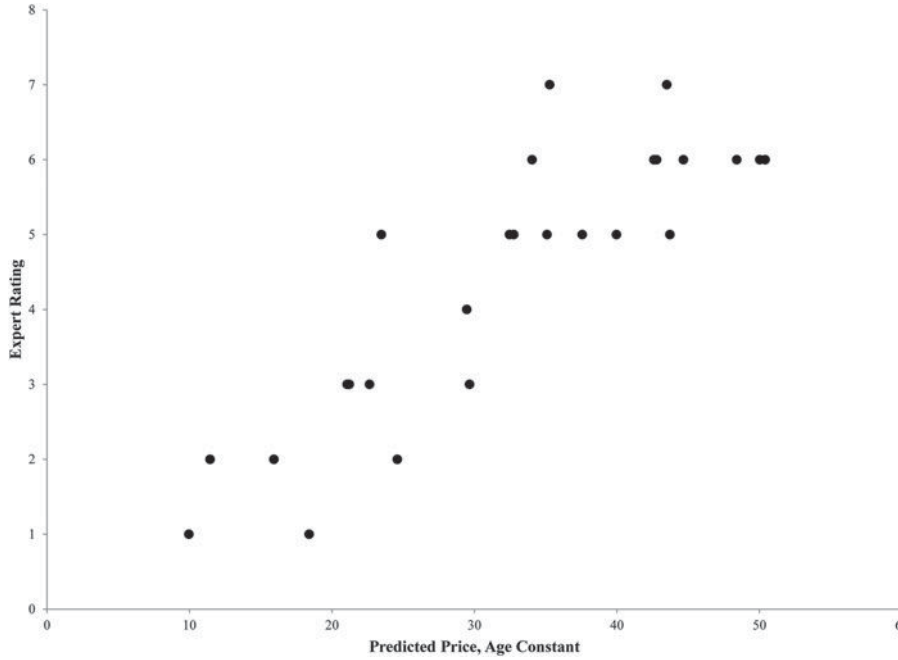
To explore this issue in more detail we have divided the data in half based on the weather data and reported separate regressions in columns 4 and 5. Column 4 contains the results for the below-average-quality vintages (based on the predictions from the regression in column 2) and column 5 contains the results for the above-average-quality vintages. The goal is to determine whether the experts' ratings provide any information within groupings based on the weather. It is apparent from the results in column 3 that the experts' ratings are not useful predictors of the vintage price index for the weak vintages, although the weather data remain a marginally useful predictor. The experts' ratings are somewhat more powerful predictors among the better vintages, but taken together they are not statistically significant for these vintages either. This suggests that the experts' ratings provide much of their value in column 3 because they help to distinguish between the top and bottom halves of the distribution of quality.

The failure of the experts' ratings to provide any useful information in predicting among the bottom-five quality groups suggests that the power that these ratings have may be a result of self-fulfilling prophecies. If these ratings provide no information other than that provided by the weather, then any effect that they have may be a result of their being used independently of the quality of the wines as a basis for investment.

Fine wine, unlike fine paintings or collectibles (like stamps and baseball cards), has historically been purchased in order to drink. If it is being purchased for other purposes as well, then there is no reason why its stated desirability may not become an intrinsically desired characteristic, quite apart from its drinkability. However, it seems likely that it will only be the most highly sought after wines that will be influenced by this source of demand. The fact that it is only the most highly rated wines that attract higher prices suggests that the experts' opinions are in demand to produce values that are entirely in the eye of the beholder. If this is true, then the experts' opinion can be used by those who sell fine wines to "create" collectibles. This hypothesis probably deserves further, more direct testing.

Figure 1

Expert Rating Versus Weather-Predicted Price



IV. The Determinants of Experts' Opinions

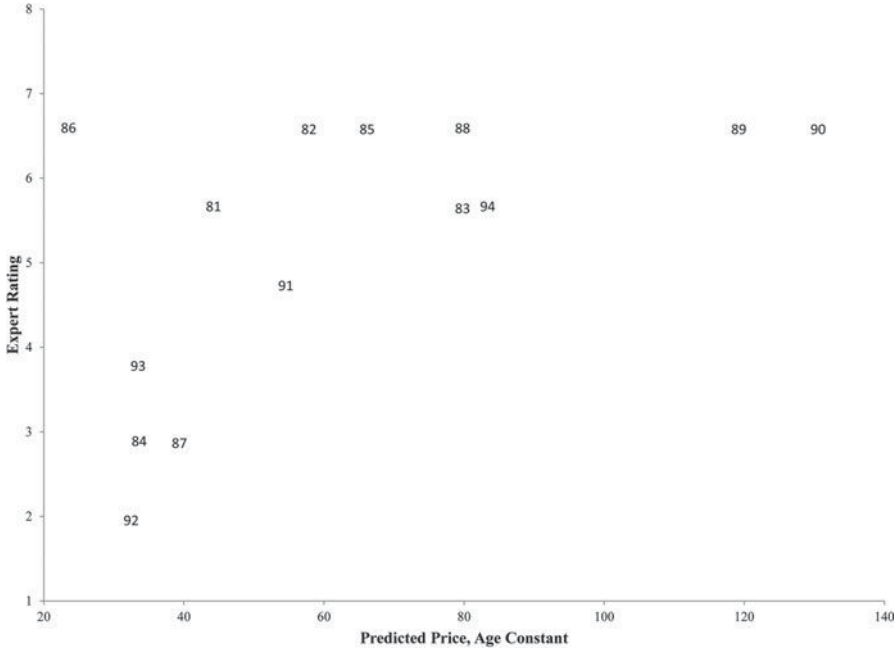
Table 2 shows the results of several analyses of the determinants of the experts' ratings. The results in Table 1 suggest that the experts' ratings tend to underweight the value of the weather relative to an index that would best predict the prices of the wines. Table 2 provides a test of whether the expert ratings ignore any of the weather factors.

In fact, the results in Table 2 indicate that the weather variables are all generally statistically significant predictors of experts' ratings. In fact, the relationship between the experts' rating and the weather as measured by the linear fit of the price data to weather data in Table 1, is displayed in Figure 1 and shows a close relationship. The variable that measures the winter rain is marginally statistically significant, but the other two meteorological variables are highly significant determinants of the ratings.

The results in columns 1 and 2 of Table 2 are regressions of the experts' quality rating on the weather data. Since the quality variable can only fall in the interval from 1 to 7, and because the regression predictions are unbounded, it is well known that the regression method is not entirely suitable for this analysis. Because the experts' rating is meant to be ordered, however, the ordered probit results in

Figure 2

Expert Rating and Predicted Price, 1981–1994



columns 3 and 4 may be more suitable to interpretation. In fact, as a comparison of the results in the table indicates, however, it makes little difference which method is used for making inferences about whether a particular weather variable is a significant predictor of the experts' rating.

The results in Tables 1 and 2 taken together indicate that experts' ratings are useful predictors of the ultimate price of the wines. This provides some justification for those who wish to study the climatic determinants of wine quality in situations (see Ashenfelter, 2014; forthcoming) where no data on price exists, but where there are data on experts' ratings, they may be substituted for prices. Studies of the effect of the temperature and rainfall on wine quality may, therefore, be possible even when no data can be obtained on the prices of the wines.

The data in Figure 2 indicate that in recent years there has been considerably more disagreement between the weather predictions and the predictions of the experts. Although they are still highly correlated, the experts have declared top vintages in fully half the years during the 1980s, with an especially strong disagreement over the 1986 vintage. It will take some years before all the uncertainty about these vintages is resolved, but since they are top-rated vintages, it is plausible that they will always be more highly priced than would be if predicted by the weather (as was the case in the earlier data), If so, it should be possible to provide

evidence—by tasting methods alone—of whether this is the result of a self-fulfilling prophecy or greater predictive power of the experts in determining the fundamentals of wine quality.

V. Conclusion

The data indicate that experts' ratings are not efficient predictors of the prices of mature Bordeaux wines because they do not incorporate all the publicly available information that is useful in making predictions. Expert ratings do, however, reflect qualitatively the same weather factors that have been documented to be determinants of wine quality. They do, therefore, provide valuable information when nothing else is available.

In addition, experts' ratings do have an independent effect on wine prices over and above the fact that they are useful summaries of the weather. It is possible that this additional effect of the experts' ratings on prices is a result of private information. Because the experts' ratings have an independent effect only for the highest rated wines, however, it is also possible that the experts' ratings influence prices because they create values that are independent of the function and thus become self-fulfilling prophecies. To the extent that this occurs, it may be expected that some wines will take on the character of collectibles, much as stamps, baseball cards, and other items have taken on values independent of their functions. It would be useful to find ways in which these ideas might be put to a more direct test.

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