

Love or Money?
The Effects of Owner Motivation in the California Wine Industry

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Abstract:

Many industries are characterized by heterogeneous objectives on the part of firm owners. Owners of private firms, in particular, can sometimes be expected to maximize utility, rather than profits. In this paper, we model and measure motivations of owners in one particular industry, the California wine industry. In both a formal model and an empirical analysis, we examine the implications of these motivations for market behavior. We find evidence that owners with strong non-financial motivations choose higher prices for their wines, controlling for quality. We also find that utility-maximizers are more likely to locate at the high end of the quality spectrum, whereas profit-maximizers are more likely to locate at the lower end. Owners with less concern for financial return choose to produce only high-quality wines. We conclude that the presence of a significant number of utility-maximizers within an industry lowers the financial return to producing high-quality wine and may discourage entry into the high-quality segment on the part of profit-maximizing firms.

I. Introduction

When modeling firm behavior, economists typically assume that the objective of the firm is profit-maximization. There are two reasons for the prevalence of this assumption. First, more complex behavioral rules for firm behavior invariably reduce the parsimony, elegance, and analytical tractability of economic models. Secondly, profit-maximization seems justifiable on evolutionary grounds. Because profit-maximization implies tremendous incentives to minimize costs, any firm that does not behave *as if* it is a profit-maximizer may not be able to survive in the long-run. While this evolutionary argument is not always explicitly invoked as justification for the assumption of profit-maximization (see Alchian (1950) for an explicit statement), the essential claim has rich historical roots, dating back to the classic writings of such scholars as Smith, Marx, and Weber.

In this paper, non profit-related motives can raise a firm's costs or create inefficiencies. However, we claim and provide evidence that an owner's utility for the processes or features of the firm that generate these costs or inefficiencies can compensate the owner for the lower financial rate of return. Essentially, we allow owners to maximize utility, rather than profits. Suppose a non-profit-maximizing owner (hereafter labeled utility-maximizing, or UM) derives substantial utility from some facet of the firm other than the level of profits that the firm generates. For example, if the firm produces a high quality product, the owner may value the association with the product. Or, if the firm's activities further some social cause, the owner may derive utility from the cause's advancement. Any such non-profit-related motives could adversely impact the costs or efficiency of the firm. Yet if the additional utility derived from the inefficient features of the firm is greater than the disutility from the lower return, then the owner is willing to subsidize the firm and it can survive in the market.

In this paper, we measure the motivations of firm owners, discuss the type, extent, and implications of departures from the profit-maximization principle, and then empirically examine the behavioral consequences of utility-maximization. In the process, we gain insight into the market consequences that result from the co-existence of utility- and profit-maximizing firms.

We begin with data on prices and characteristics of California wines and supplement it with a survey of winery owners' attitudes towards their firm and product. We find that many of

the people owning and running wineries in California have goals that depart from standard profit-maximization (PM). For example, 78% of our respondents would be “somewhat” or “very” unlikely to sell their winery if they could get a higher return in the stock market. Our model allows winery owners to care about the quality of their wine (separately from the effect of quality on profits) and to gain utility from lifestyle expenditures that raise production costs.

We find that owners who derive strong non-financial returns from ownership charge more for their product on a quality adjusted basis. Interestingly, the price premium declines with the length of time the owner’s family has owned the winery, which may be evidence of learning-by-doing. Those same owners locate at the higher end of the quality spectrum and are also unlikely to make the lowest-quality wine. Owners who primarily care about financial returns from their winery are less likely to produce high-quality wine. However, a winery might want to produce a high-quality wine due to the externalities it creates for ‘sister’ bottles. We find that having a high-quality wine on sale at the same time as low quality wine from the same winery raises the retail price of the low quality wine.

The conclusions of the paper have implications for the general equilibrium of the wine industry. Our first conclusion is that UMs price higher, or more “softly,” and consequently one might expect the existence of UMs to raise profits and attract entry, relative to a situation where UMs were not in the industry. However, if enough owners have resources to spend on their quality preference, they can drive down the financial rate of return to producing that type of wine for any producer. When UMs ‘consume’ the quality of the product they produce, they are willing to bid for scarce high-quality inputs up the point justified by the sum of the financial and psychic returns. The highest quality grape-growing land, and therefore the highest quality grapes, are in relatively fixed supply. Thus, in their quest to enter at the high end, wealthy UMs increase the market price of the fixed resource, land.¹ We conclude that when significant numbers of hobbyist owners consume features of their business as a substitute for profits, they create a low financial return in the high-quality segment and discourage profit-maximizing firms from operating there.

The wine industry is not the only one in which we expect a significant proportion of owners to have motivations for ownership other than profits. Firms whose owners potentially have motivations other than profit-maximization populate a significant fraction of the economy.

“Mom and pop” firms, family businesses, and larger private businesses generate about half of GDP and employment in the US.² The owners of these businesses are not constrained by shareholders with a simple financial claim on the firm. Thus, while our focus is on the wine industry, we believe that the findings of this paper have broader applicability.

The remainder of the paper will proceed as follows. A review of the existing literature is in Section II; a discussion of the theoretical implications of this phenomenon is contained in Section III. Section IV describes the data on California wines and the survey we designed and administered. It also discusses the general types of owners we find in the industry. Section V tests the hypotheses on quality and price generated earlier in the paper, and Section VI concludes.

II. Literature Review

Our interest in the market consequences of different objective functions than profit-maximization is related to a number of distinct areas of research. For instance, there is a considerable literature on the differences between and competition among for-profit and not-for-profit institutions such as hospitals and daycare centers. (See Rose-Ackerman (1996) for a survey of nonprofit organizations and economic theory.) Rose-Ackerman (1986) shows that nonprofit daycare centers produce high quality service, charge a low price and survive in a competitive market because of donations. Customers queue for the right to purchase the nonprofit product, while unmet demand patronizes the for-profit sector. Schiff and Weisbrod (1991) examine the issue of competition between nonprofit and for-profit organizations in ancillary commercial markets. In their model, nonprofits get disutility from producing the ancillary commercial good, but produce it to earn profits to finance charitable production. They find that the tax-free status of nonprofits causes distortions in the commercial market, and that changes in donations will affect competition in the commercial market by causing nonprofits to compensate for lost donations with commercial output.

¹ One winery owner told an author in a 1998 interview that a Napa winery had been forbidden to purchase vineyards by its parent (for-profit) corporation because Napa land prices were so high.

² The Family Business Center at Loyola University estimates that 80% of American businesses are privately owned. (Steinberg 1996). This estimate is most likely conservative. Eddy (1996) includes estimates that as much as 90% of American business is private and as much as 40% to 60% of the U.S. Gross Domestic Product comes from privately owned enterprises. Prince (1996) reports that as many as 95% of U.S. businesses are family owned.

Lakdawalla and Philipson (1998) try to explain the share of an industry that chooses nonprofit status. In their setup, there is a limited supply of altruists in the world; altruists value the output of the firm as well as profits, while traditional firms only value profits. As the level of available economic profit drops, the altruists will give up the ability to distribute profits and choose to take nonprofit status because that frees up resources to increase output. They find support for the comparative statics of their model in the US long-term care industry.

Becker's (1957) theoretical work on discrimination in labor markets is also related to our interest in the market consequences of utility-maximizing firms. In contrast to the already mentioned research which uses legal form of the organization to infer objective function, Becker allows employers (and consumers and employees) to have individual tastes for discrimination. Firms that have strong tastes for discrimination against a minority group will face a higher total cost of employing members of that group than firms that are not discriminatory. In Lakdawalla and Philipson (1998), Neary (1997), Schiff and Weisbrod (1991), and our model, "altruists" can drive profit-maximizing firms out of the industry if there are enough of them to satisfy demand.

A second area of the literature that is closely related to our problem is analysis of worker-run firms. The classic choice of objective function for a firm owned by its workers is income per worker (Ward (1958)). Futagami and Okamura (1996) show that the labor-owned firm will use more capital-intensive technology and produce more output than the profit maximizing firm in a duopoly. Craig and Pencavel (1996, 1992) undertake a similar project to ours by empirically examining worker-cooperative and profit-maximizing sawmills in the Pacific Northwest. They find that when output prices change, cooperatives adjust wages more than for-profit firms do. Traditional for-profit corporations are more likely to adjust working hours or employment with the price of plywood.

While these lines of research document or postulate the existence of organizations with objective functions that contain more than profits³, or model competition between types, there is no work we know of that seeks to measure directly owner motivations within one industry and then relate these motivations to variations in market behavior. Our empirical work seeks to accomplish this for the California wine industry.

III. Theory

This section will address more specifically what winery owners might have in their utility functions and our model of competition.⁴ There are two general types of inputs the owner may value: those that consumers also value, s , and those that consumers do not value, t . The most general example of the former would be quality, while an example of the latter might be an owner's hiring a wine-maker who has a French accent and costs more, but is not better than other wine-makers. The latter case is simpler to analyze because the utility-maximizing owner's investment in t does not alter the demand curve.⁵

There are many tastes an owner could indulge that consumers of his or her wine would not value. For example, the owner could live the life of a landowner engaging in rural and social pursuits in the company of like-minded friends. Such an owner might tolerate some inefficiencies in running the winery that cater to that lifestyle, such as paying employees more than marginal product, not exerting enough effort to reduce costs, or continually interfering in the production process in a manner that raises cost. This could generate higher marginal costs, perhaps without any effect on quality. Indeed, owners we interviewed had the opinion that the presence of outside equity had a rationalizing impact on costs. Suppose the owner's utility function is additive in profits and the benefits from using this particular type of input, t . The owner's utility has an additional term, $\alpha h(t)$, which represents the value of these benefits. PMs have $\alpha=0$ while UMs have $\alpha=1$. ($h'(t)>0$ and $h''(t)<0$).

The other type of preference the owner might have, and be willing to pay for, is quality in and of itself. For example, wine can ferment in stainless steel tanks, American oak barrels, or French oak barrels. Barrels are much more expensive than steel tanks and are used for all good

³ Managers have a legal obligation to maximize shareholder value, but may have personal incentives to utility-maximize; in this sense our work is related to the agency literature.

⁴ We take owner utility functions to be primitives for our problem. There is a growing economics literature modeling status and allowing goods to become endogenously desired by high-status people (fads). However, any empirical attempt to explain *why* people like to make high-quality wine, or to own land, or to be nice to employees, is well beyond the scope of this paper.

⁵ Our problem is also analogous to the compensating differential labor literature as in Weisbrod (1983). Suppose the manager of the winery were an employee instead of the owner, but this manager still gained utility from expenditures s and t . One possible contract the owners of the winery might choose is to allow the manager to make expenditures s and t and lower his wage by an amount that makes him indifferent to running the winery without s and t . Naturally, this sort of contract is limited by the initial wealth of the manager. Such a firm would be maximizing profits. However, our interest in either case is changes in policies due to the particular preferences of the manager-owner.

wine. French barrels (\$700) make better wine than American barrels (\$300).⁶ Similarly, a winery may make its wine with higher quality grapes that are more expensive.⁷ We model the cost of quality by including an additional term in the cost function of the winery, $g(s)$, that represents the benefits accruing to the owner from producing a given level of quality s . ($g'(s) > 0$, $g''(s) < 0$). The demand curve for wine shifts out with increases in s .

The activities of the winery owner may be a combination of those that increase quality and those that bring no benefit to consumers:

$$U(p, s, t) = q(p, s) \cdot p + \alpha [g(s) + h(t)] - C(q(p, s), s, t)$$

We do not allow owners to choose high s or t and zero quantity. Since our dataset includes only wineries with positive output, this condition will not bind in the empirical work. The owner is subject to a budget constraint, about which we will have little to say due to lack of data. Very wealthy UMs may not be constrained by a budget, or its shadow price may be very small, and we would not expect PMs with access to capital markets to be constrained either. However, some UMs will have a limited stock of wealth to lose.⁸

We assume the market for wine is monopolistically competitive. No producer is earning economic profit, but each faces a downward-sloping demand curve due to the strong differentiation between products. Indeed, the wine industry is an excellent example of a market in which small price differences (one standard deviation above the mean love factor for the average bottle results in a 30 cent premium) can be sustained in equilibrium due to heterogeneous tastes on the part of consumers for the wine, its label, the shape of the bottle, etc. In the wine industry there is both vertical and horizontal differentiation. For example, one of two bottles of the same

⁶ Conversation with LeRoy McGinnis of McGinnis Wood Products, Inc., August 1998. The prices quoted are for premium barrels where the wood has air-dried for longer before being made into a barrel.

⁷ An acre of land in Napa valley cost about \$29,000 in 1988, whereas grape-growing land in the Central Valley, a much less famous area, cost approximately \$3,257 per acre. The price of an acre of land in Napa Valley in 1997 was \$47,000, and in the Central Valley was \$6,367. (Land prices are calculated from the Napa Valley and Tulare County Assessor's offices; it is the average of reported transaction prices in current dollars divided by gross acreage.)

⁸ Modeling and collecting data on the wealth of winery owners and the amounts they choose to lose is beyond the scope of the paper. The wealth of current and potential utility-maximizing owners is very important for outcomes such as entry and resource prices in the industry. However, because macroeconomic conditions and many other forces affect people's stock of wealth and their willingness to lose money on a winery, we do not attempt to include a formal analysis of owners' wealth in the paper.

quality level (no vertical differentiation) will generally be preferred by a consumer due to personal taste (horizontal differentiation).⁹

PM owners choose $t=0$ because t has a positive cost and brings no benefit that consumers value, hence it does not increase the owner's utility. However, the UM owner enjoys t and will invest in input t up to the point where marginal benefit equals marginal cost. Suppose that two owners with different preferences have identical quality wines and face individual demand curves with the same level and elasticity. The model implies that the UM firm has expenditures t , and therefore higher marginal costs than the PM firm; the UM owner will therefore charge a higher price relative to the wine's merits and sell a smaller quantity than the PM owner.

Both PMs and UMs may want to invest in s . The PM will choose a level of quality, s^* , such that the marginal cost of quality is equal to the marginal financial return. When the owner gets both a financial *and* private return on the investment, he will invest more than is justified by the financial return alone. The empirical implication of the model is that UM owners will position their wines higher on the quality spectrum than PM owners. If the simple arguments above hold in the full maximization problem, optimal price will be higher for owners with a positive α (UMs) conditional on quality, and optimal quality choice will also be higher for owners with positive α .¹⁰ The empirical section of the paper will test these two hypotheses.¹¹

The arguments of the utility function are likely to be quite different in other industries where owners might maximize utility; we are not claiming that the specifics of the model above apply to art galleries or other utility-maximizing settings. For example, the owner of a magazine of opinion probably gets utility from higher circulation figures for the magazine. Similarly, a

⁹ We assume that not only is each producer's product differentiated, but that it is difficult to imitate a competitor's product exactly. This helps owners who spend t and face lower cost competitors. Because the competitors cannot exactly imitate the inefficient firm, if consumers value the wine enough the winery can survive.

¹⁰ The three choice variables, price, quality expenditures, and lifestyle expenditures, will move together for UM owners if the utility function is supermodular. If "increasing any subset of the decision variables raise[s] the incremental returns associated with increases in the others." Milgrom and Shannon (1994) However, supermodularity is not necessary (although certainly sufficient) for the specific relationships above to be true.

¹¹ An important hypothesis we will not consider is allowing consumers of wine to use price as a signal of unobservable quality. We assume that there are enough knowledgeable consumers in the market and enough information on ratings and measures of quality that this effect may be safely omitted from the model. Also, a winery owner might care about preserving a family tradition of owning and operating the winery in a certain way. The largest constraints on such an owner are likely to be to hire everyone in the family who wants a job at the winery, and not to raise capital in a way that would dilute ownership or control. The resulting behavioral difference between these owners and others will be that further investment would be productive, but is not being undertaken due to these constraints

philanthropic inventor who gets utility from social surplus would want his or her invention disseminated to as many consumers as possible. We assume that quantity produced or sold is *not* an argument of a winery owner's utility function. Our interviews with owners did not ever indicate quantity was a goal. While an owner wants to make enough wine to supply the restaurants, competitions, and friends he is anxious to impress; beyond the small-scale production that can supply those parties, additional quantity does not increase private benefits.

IV. Data

Wine Data

The data for this paper was collected by Beth Benjamin from the Bureau of Alcohol, Tobacco, and Firearms, *Wines and Vines Buyers Guide*, *Connoisseur's Guide*, and other industry sources. The dataset has complete information on California wines and wineries during the time period 1980-1990 (see Benjamin (1994) for detailed information regarding collection of this data). A bottle of wine is described by its price, the year it appears in *Wines and Vines*, vintage, grape varietal, the appellation on the label, the quality of the bottle and its vintage, whether it is ready to drink, and a variety of characteristics of the winery producing the bottle. The same bottle can appear in the data in more than one year; over time the bottle's price and some other characteristics (ready to drink, for example) may vary. Prices therefore belong to a bottle-calendar year combination, but the panel is not balanced. Price is taken from the *Connoisseurs' Guide to California Wine*; they report the suggested retail price of a bottle sold individually in a particular year in California.¹²

A winery may produce many types of wine: wineries can produce different varietals under the same or different labels (brands) that may reflect a particular quality positioning. The winery can also make multiple products. Examples of popular products include table wine, dessert wine, sparkling wine, and brandy. The average cost of a bottle in the dataset is \$9.50; the minimum price is \$2. The group of wines in the \$2-\$3.50 range includes many varietals: red table wine, zinfandel, cabernet sauvignon, and chenin blanc are the most popular. The producers of these

¹² The Connoisseur's Guide's goal is to provide a price that will resemble what the reader encounters at the local wine store. The price they report is the actual price of the bottles they buy. Since the wines have just been released, they are not on sale. Occasionally, the Connoisseur's Guide buys a bottle at a "discount" store, in which case they do not use the discounted price, but report the suggested retail price obtained from the winery. This winery suggested retail price is what a reputable wine store would usually charge.

inexpensive wines include a range of producers such as Almaden, Beaulieu Vineyards, Fetzer, Gallo, Glen Ellen, and Paul Masson. The most expensive wine in the dataset is Stag's Leap cabernet sauvignon which cost \$75; other expensive wines in the dataset are produced by Heitz Cellar, Chateau Woltner, Caymus, and Silver Oak Cellars. See Table I for means and standard deviations of the variables in the wine dataset.

Survey Data

To determine the motivations of the owners in our dataset, we mailed a survey in January of 1997 to each winery in the dataset for which we could find an address. A copy of the survey is located in the Appendix. Approximately 13% of the wineries in the dataset were un-locatable; we searched in several data sources and if we could not find an address, that winery did not get a survey. We asked the owner or majority partner of the winery to fill out the survey and return it, which resulted in a total of 184 survey replies out of 411 mailed. We received the replies in February-April of 1997. Our response rate is therefore 45%. Summary statistics for surveys follow in Table II. We tried to construct questions that would get owners to quantify their non-monetary benefits and describe what kinds of things the non-monetary benefits are. The replies indicate there is a substantial amount of utility-maximizing behavior going on in the industry. 78% of owners would be “somewhat” or “very” unlikely to sell their winery if they could get a higher return in the stock market. Almost 40% of respondents would lose over \$10,000 to improve the quality of their wines. Although almost all respondents aim to cover costs and earn some profit, less than half have a specific target rate of return in mind. The mean respondent does between a quarter and a half of his socializing with “wine people.”

We assume the responses reflect actual preferences of the respondents. They were told the survey contents would remain confidential, so unless they felt a need to convince the authors of their preferences, there is no one to whom they could be sending a message.

Table III shows how different non-monetary benefits of owning a winery are correlated. Entertaining is positively correlated with being willing to lose money to get quality, being less willing to sell for fair market value, feeling family ownership of the winery is important, having owned the winery for a longer amount of time, and not having a particular rate of return in mind.

People who are willing to lose money for additional quality also entertain, don't want to sell their winery, and have more non-monetary reasons for owning the winery.

An owner's view of Gallo seems to do a good job of capturing his general type. Gallo is the largest winery in California and is known to be run in a professional manner that takes full advantage of its size and market power, although it is family owned. The vast majority of the wines and spirits they produce are generally regarded as being quite low quality, although the firm now makes some higher quality wines. Respondents who rate Gallo as 'a superior winery' have owned their wineries longer, have a particular target rate of return in mind, are not in the wine business for the lifestyle, and earn a significant portion of family income from their winery. Those who have owned their winery for a long time are also less apt to say they are in the business for "love of wine." This may be because wineries that are less businesslike exit the industry, so age is correlated with less love of wine.

We undertake a formal factor or "principal components" analysis to determine the relationships among the survey responses.¹³ The intuition behind principal components is to find (fewer) new variables that efficiently predict an owner's responses; the results will be a few underlying characteristics that predict preferences well. We perform a standard factor analysis to obtain six principal components and then rotate the components (varimax). We decide to use only two factors, those with significantly higher contribution to variance than the others. The factor loadings are presented in Table IIIc. The first factor positively loads on entertaining, being willing to lose money to improve quality, short ownership tenure, not having a particular rate of return in mind, being in business for the love of wine, and disliking Gallo. We call this the *love* factor; it is clearly picking up owners who derive substantial non-monetary rewards from owning a winery. The second factor is complementary. It loads on entertaining also, not losing money to improve quality, being willing to sell the winery for a fair price, undertaking little new investment if cash became available, and not feeling it is important for the winery to stay in the family. This factor will be called the *money* factor and summarizes a profit-maximizing and businesslike attitude on the part of owners.¹⁴

¹³ See Hotelling (1933) for an explanation of this technique.

¹⁴ The third factor picks up a characteristic of wineries we do not focus on in the paper, small family businesses that get most of their income from wine, have owned their wineries for a long time, and whose wines are named after the family. It is not clear how such attributes would affect α , and because this factor contributes less to explaining variance in responses, so we do not use it in the analysis.

Wineries that answered the survey clearly differ from wineries that did not. Principally, the non-respondents are bigger; the mean storage capacity for a respondent is 705 (thousand gallons) versus 2337 for the non-respondents. Kendall Jackson and Gallo did not fill out a survey. In terms of acreage, the respondents are actually somewhat bigger (333 versus 181). These statistics suggest that the larger wineries producing the lowest quality wines were less likely to answer; these wineries do not own their own land since the grapes they use are a commodity, but their large scale of production requires more storage capacity. This group of wineries likely contains the few public wineries that existed at the time. Additionally, we suspect that as wineries grow in size, the use of professional management reduces the impact of owner preferences on particular operational choices. Hence, the non-respondents may be a group of wineries with less variation in the characteristics we are studying. However, mean price and quality ranking are almost equal across the two samples. Slight differences exist in status, age, and availability; respondents are higher status (.53 v .48), older (31 v 21), and have slightly more available wine (1.84 v 1.93). Distribution capabilities do not differ significantly across the two groups.

V. Empirical testing

Quality Choice

There are few exogenous features of a winery that predict quality, rather than being chosen simultaneously with it. As a consequence, the quality regressions reported in Table IV will be sparse. Bottle quality is postulated to be a function of varietal (type of grape), vintage (year grape is grown), and appellation (geographic source of grapes). Clearly a winery has no control over the weather, and in the short run, particularly if it grows the majority of its own grapes, has less control over appellation and varietal selection.¹⁵ Winery age and age squared are also included as explanatory variables.

Column one of the table includes answers to survey questions to see if these can predict bottle quality. If an owner is willing to lose money for quality, he or she makes higher quality wines. Similarly, those that are in the business for a love of wine and those that have made all the

¹⁵ Even when a winery purchases its grapes from a grower in another appellation region, the contracts for such purchases are typically of at least a three-year duration. Therefore, even if a winery does not use its own grapes, there are some constraints on the ability to chose an appellation.

improvements they want to their winery make higher quality wine. Interestingly – but perhaps not surprisingly -- those who think Gallo is a superior winery choose to make lower quality wines. Vintage, varietal, and appellation dummies are largely significant. The adjusted R^2 is not high, 0.083, due to the shortage of explanatory variables. Specification two includes the *love* and *money* factors rather than the raw survey answers and confirms the previous results. The *love* factor significantly increases the likelihood that a particular bottle will be high-quality wine, while the *money* factor decreases it.

We also examine the determinants of a winery's average, minimum, and maximum quality. The variables are defined for a particular vintage year belonging to a particular winery. Average quality is not weighted by volume or sales since we do not have that information. Only vintage dummy variables are included since a winery's best or worst bottle in a given vintage could be one of a number of varietals or appellations. In these regressions each winery-vintage has only one observation, so the number of observations drops considerably. Average winery quality is again significantly affected by the *love* factor, but the *money* factor is insignificant, though of the correct sign. The relationship documented in columns two and three of Table IV can also be seen in the plot of average winery quality against *money* shown in Figure 1. There is a weak negative slope to the cluster of points. While the high quality and high *money* quadrant is relatively empty, there are many owners who do not care about profits but do not seem to be able to produce high quality either, weakening the relationship. *Love* is associated with high quality as can be seen in Figure 2. Here, as in the regression, the correlation between winery quality and owner motivation is stronger. Additionally, across all specifications older wineries produce lower quality products, although this pattern reverses for the very oldest wineries.

One might think a winery's minimum quality represents something about an owner's taste and his or her willingness to manufacture cheap products. Indeed, high values of *love* significantly increase the lowest quality a winery will manufacture (while *money* is insignificant). It seems that owners with substantial private benefits from making wine are unwilling to make the lowest quality wines. The outcome is exactly reversed when predicting maximum winery quality. *Love* is insignificant in column 5, but having a high value of *money* discourages an owner from producing high quality wines. Here we can see that the attractiveness of an industry with non-financial benefits for owners who are PMs depends in part on the distribution of tastes

across UMs and consumers. If all UMs get positive utility from consuming an attribute like quality, the high-quality segment will be crowded with hobbyist suppliers. If consumers like the attribute too, then that same space would normally be desirable for PMs. However, as the results above suggest, it may be sufficiently crowded with hobbyists that positive financial returns are not attainable.

Recall that the previous literature shows that if there are enough UMs in an industry, they can drive out the PMs by lowering the returns in their preferred segment. If the conjecture is true we should also see winery owners who are more indifferent to financial returns being more likely *not* to compete in the low-end segment. To test this proposition we focus on the survey questions that most closely pick up an owners attitude toward financial return. The question, ‘Do you have a specific rate of return in mind?’ is the best match for our problem. We also include ‘how much money are you willing to lose to improve the quality of your wines?’ and ‘improvements would not be undertaken with more resources;’ these questions track the preferences of the owner for quality and also measure the extent to which the owner is willing to spend financial resources on quality.

Because we use many individual questions in this regression, including the love factor would be redundant. Instead, we include the four survey questions most highly correlated with *love*. These variables, in addition to the three questions mentioned above, are used to explain a winery’s choice of minimum quality in a particular vintage year, and whether or not the winery chooses to make a wine of quality level zero, the minimum level.

The results are presented in Table V. Lack of concern for financial return significantly predicts the choice not to produce lower quality wines using two different specifications. The first column reports the results of an ordered probit on minimum winery quality whereas the second column shows the results of a standard probit where the dependent variable is a one if the winery chooses to make a wine of quality zero. Being willing to lose money on quality and having undertaken all desired improvements also generally raise the minimum quality choice of the winery, as we also saw in Table IV.¹⁶

¹⁶ The large positive demand shock for high quality wines in the late 80’s may have counteracted the crowding effect caused by utility-maximizing producers and raised the *ex post* return to producing high-quality wines. However, this shock was unanticipated and, because our sample ends in 1990, would only have affected prices for wines that had already been made.

The implications of the dependence of quality choice on owner motivation are interesting. It appears that there are some competitors who will enter the high quality segment of the market, even if it is already crowded. Some are rich enough to buy quality as a consumption good. Over-entry into the high-quality end of the spectrum lowers returns to producers of high quality wines. PMs want financial returns and are less willing to stay in a low-return segment, even if it is the high-quality segment.

Predicting the price of a bottle

How should owner motivation affect price? Our theory predicts that quality-adjusted prices should rise with the owner's private benefit parameter, α . We expect that the answers to the survey questions contain information about each owner's α parameter. To analyze these effects, we proceed in two steps. First we develop a specification that predicts price, check the results, and compare wineries who responded to the survey and those who didn't. Secondly, we capture the broad types of owners from the survey by including in the price regression the *love* and *money* variables constructed from the factor analysis.

We use the natural log of price as the dependent variable. Several categories of fixed effects must be included to pick up wine characteristics that strongly influence price. Varietal fixed effects control for different prices attached to different species of grapes. Grapes differ in their difficulty and cost of cultivation and also in their popularity. Vintage fixed effects are included because quality varies systematically across years, but is more constant within years. Finally, there are of course year fixed effects to control for demand in any particular year. The results are not surprising, so they are discussed only briefly in the text but reported in Table VI.

We expect price to be driven primarily by the quality of the wine. Quality is measured on different dimensions by numerous variables in the dataset. The first quality variable is a numeric rating of bottle quality from the *Wines and Vines Buyers Guide* that is an integer between zero and three inclusive. Although this particular rating takes on only four values, we use it because of its complete coverage of varieties and the fact that blind tasting determines the ratings.¹⁷ Secondly, the average quality rating of all the bottles produced by a winery over the previous three years is also constructed. Other important quality variables are *status* and *three year*

average of winery status, which essentially measure the quality one would expect based on reading the label. These were constructed by Benjamin and Podolny (1997) according to the deference ordering among the appellations used on the labels of bottles of wine produced in California. A higher status appellation is one that a winery chooses – over other options allowed by the grapes that compose the wine – to write on a label.¹⁸ Note that status is picking up other aspects of quality than those measured in the simple rating above; the correlation between status and tasting rating is only 0.15. However, over the longer term the two are more closely related; a winery’s average tasting rating over three years and the average status of its bottles over three years have a correlation coefficient of 0.59. The remaining quality variables include *vintage* and *varietal*, a *rating* of the vintage, whether the wine is *drinkable*, whether or not the wine is considered to have a *tannic* character, and whether the wine is *irregular*. *Wines and Vines* also notes if the wine is *early maturing*, whether the wine is *available*, and how *ready it is to drink*.

We would expect a winery’s marginal cost to affect its choice of an optimal price for a bottle of wine when it faces a downward sloping demand curve.¹⁹ The most important determinant of costs observable to the econometrician is the scale of production. There are several variables in the dataset that proxy for winery size, although, unfortunately there is no direct measure of output or cases sold in a particular year. *Vineyard acreage*, *storage capacity*, *number of brands* (e.g. Turning Leaf), and *number of products* (e.g. table, sparkling, dessert) all reflect size, and therefore economies on the manufacturing side.²⁰ Additional economies of distribution are picked up in several distribution and wholesaling variables (e.g. *wholesale*, *export*) that indicate the firm has permission from ATF to ship the wine to different places.

The effects of the variables on log price are reported in Table VI. Because the tasting rating variable takes on only four values, it is included as three separate quality dummies rather

¹⁷ The tasters taste different wines of the same vintage and variety at the same time, but do not know the identities of individual bottles.

¹⁸ See Benjamin and Podolny (1997) for a detailed discussion of the construction of the status variables and their implications for price and the returns to investments in quality.

¹⁹ Wineries are not tax shelters and never have been. However, before 1986 a vineyard was a tax shelter because it is agriculture. The farming cost of planting new vines could be immediately expensed, generating a loss for the vineyard that year even though the project as a whole might have positive net present value. The tax shelter reason for owning a vineyard has disappeared due to the tax reform act of 1986. As far as we can tell there is not really a reason to think that marginal costs differ across firms for tax reasons, for example.

²⁰ Note that a winery makes wine and a vineyard grows grapes. A winery can be vertically integrated, leading to the usual results on relationship-specific investment in grape-growing by the vineyard. A winery could instead have a

than as a continuous variable. The results are exactly what one would expect. Higher rated wines and higher status wines cost more. All the quality coefficients show that price increases as quality increases.²¹ The cost variables are also significant and have the predicted signs. Larger wineries, measured by production, storage, or distribution, charge less for their wines. The most expensive varietals include the most popular grapes, Cabernet, Chardonnay, Merlot, and some others such as Marsanne, Voignier, and Pinot Noir. Prices increase over the years in the dataset, particularly in the late 80's.²²

Note that the measures we have of scale are not measures of quantity. Unfortunately, the dataset does not have production quantity information. Thus, the storage capacity and distribution variables actually measure the size of the winery's operation, not its choice of quantity in response to price in a particular year.²³ As a check, we ran the regression without the cost variables and the remaining estimated coefficients were almost identical to those reported.

The Effect of Preferences on Prices

Table VII reports the same price regression as Table VI with the addition of *love* and *money*.²⁴ Those wineries scoring high on the *love* factor have higher prices, while those scoring high on the *money* factor have lower prices. This evidence is consistent with our theory that UMs have higher (marginal) costs than PMs. The estimated coefficients are not sensitive to the particular combination of explanatory variables chosen. This result is the second major contribution of the paper.

long term contract(s) with vineyard(s) or purchase grapes of any quality on the spot market. Hence acreage may be correlated with production but is not necessarily an accurate sign of production levels.

²¹ *Ready to drink* may also be picking up unobserved quality, since lower quality wines are not intended for storage and are always ready to drink.

²² An interesting feature of the results is the importance of the age of the vineyard, which is not present in the later years of the dataset. The effect of age on pricing is quite robust and is shaped like a sideways, backwards "s." Prices increase steeply in age from zero up to ten or so, then there is a gentle dip that bottoms out at about 75 years, followed by an increase in price for older firms, catching up to the earlier peak at about age 120. Very new firms have no reputation among consumers and appear to charge an "introductory" price to build demand; wineries ten years old or less charge less for a bottle conditional on quality and scale of operation. Firms in their prime -- those between ten and 50 years old -- have the highest prices.

²³ In addition, simultaneity between price and quantity is not a problem because of the nature of wine production, particularly at the top end. Producers presumably do make quantity choices based on current and expected prices, but by the time the wine is ready to be sold the demand curve has moved in unexpected ways (several years have gone by) and by then price cannot physically affect quantity provided.

²⁴ We do not report the regression using the raw answers to the survey questions as the factors do a much better job explaining prices.

It is possible that the love and money variables are picking up unobserved quality, which is also affecting price. In such a case, the estimated coefficient on *love* will represent unobserved quality correlated with *love* rather than the behavioral effect of those owners who love making wine. Note, however, that quality is well controlled for in the regression; we have the quality rating variable, status of the label, three-year quality of winery, three-year status of winery, vintage dummies, varietal dummies, *tannic*, and *ready to drink*, among other variables that all measure aspects of the quality of the wine. We also include variables from the survey that are not important components of love or money but will pick up any remaining unobserved quality. The only change is an increase in magnitude of the *money* coefficient.²⁵

For the unobserved quality criticism to be valid, there must be a systematic bias in the way we measure UM's wine quality as opposed to other wine quality. Since all wine attributes are measured the same way, the only way a bias could emerge is if there is a missing attribute that is characteristic of UM wines. The only attribute we could think of that fits these criteria is the 'estate' designation. An 'estate' designation means that 100% of the grapes in the wine have been grown on the winery's own land. This characteristic is not recorded in the data. We suspect that UMs disproportionately make estate wines, which are typically higher quality, because they like to walk around surveying their lands, rather than contracting for the purchase of grapes.

We contrast the estate hypothesis with the preferences hypothesis in an indirect manner, by examining how love and money owners' prices vary with the length of time they have owned their wineries. We interact the number of years the owner or his family has owned the winery with *love* and with *money*.²⁶ The third and fourth columns of Table VII show the results of the specification. The important finding is that both types of owners experience declining prices with the amount of time they have owned the winery. High love owners' prices fall faster than high money owners' with the length of time the winery has been in the family, while the *love* coefficient is still positive and significant. This implies that two owners with the same measured preferences will have different prices for the same bottle of wine depending on how long they

²⁵ We also experimented with interactions between these variables and financial resources to reflect the situation where the owner has a preference for quality and additionally has sufficient wealth to carry out that preference. Importantly, the coefficients on the *love* and *money* factors are almost entirely unchanged and continue to be significant regardless of the specification.

²⁶ To make the experiment as clean as possible, the *love* and *money* factors in these regressions are constructed without the ownership years variable.

have run their wineries. Is unobserved quality declining over time for owners who have high *love* scores in 1997? This seems unlikely.

Learning-by-doing is a natural explanation. Because many aspects of making wine are not scientific, but must be experienced, the results are consistent with the gradual reduction in the cost of utility-maximizing behavior as owners learn how to run their wineries efficiently over time.²⁷ (Love owners who do not reduce costs and prices over time may have exited and not be in the sample.) UM owners have more to gain by learning how to satisfy their preferences at lowest cost. In particular, for the estate-bottled story to be causing the difference, the data must be gradually including the estate designation over time, which we know to be false.²⁸ The love variable, therefore, does not seem to be measuring only unobserved quality.

Another alternative hypothesis is that hobbyist owners are selling their image and story, rather than the quality of the wine. Buyers know the attitude of the owner, and they place a higher value on wine produced by someone who shares their values. In our view, such an explanation for the price difference is likely to apply to few consumers and few wineries since the explanation hinges on consumers having a relatively intimate knowledge of the motivations of individual owners. Most consumers are not well-enough informed to be paying for “values.”²⁹

In conclusion, we find evidence that owners with strong non-financial motivations choose higher prices for their wines, controlling for quality. That price premium appears to decline with the length of time the winery has been in the owner’s family

In the quality analysis above, we showed that PMs who care most about financial return are attracted to the lowest quality segment. Intuitively, the PMs most likely to remain in the high quality segment are those whose high quality wines create a positive externality for their lower quality wines. We have in mind some kind of positive shock to demand for the lower quality, “sister” wine, or higher prices. We test this idea by including variables measuring if a winery has

²⁷ Price declines might not be constant over the whole range of ownership length. However, there are too few observations to include trends for love and money in different age cohorts without losing stability of the coefficients.

²⁸ We also investigated whether the price declines were related to the vineyard acreage of the winery. An established vertically integrated producer might not take into account the rising market price of grapes over our period, and consequently price too low. High *love* owners with vineyards reduce price faster than those who do not own any vineyards at all (1/6 of the sample). This is a provocative finding, and an area for further research.

²⁹ If there is any group of owners to which such an explanation would apply, we suspect that it is owners who frequently socialize with wine people. Including this variable in the analysis slightly increased the coefficient on *love*. Accordingly, we believe that this alternative explanation – while potentially valid in some cases – does not account for a significant proportion of the effect of *love* on price. .

a bottle on the shelf in the previous year of a higher or lower quality level. We find that higher “sister” products do create a positive externality on the price of the reference bottle, while lower sister products do not. The results are robust to a number of alternative specifications. (Tables with complete results may be obtained from the authors.)

The ‘sister’ premium is substantial (at the mean, approximately forty cents for each quality level difference) and could be a reason for a winery that primarily sells lower quality wines to continue to produce high-quality wines despite unremunerative direct financial returns. The largest wineries will earn the premium on a greater volume of low quality wines. Additionally, large wineries are more likely to have distribution clout with supermarkets and other retailers that allows them to get a high-quality sister wine with very low volume onto the shelf where it can be seen by and influence consumers.

VI. Conclusions

In this paper we argue that non-profit-maximizing organizations should be observed in a market economy – despite higher costs – when those higher costs purchase some sort of non-financial return for the firm’s owner. We examine the California wine industry because there is a great deal of scope for wineries to generate interesting components of the utility function that are not profits: for example, social status, lifestyle, community membership. Our survey of winery owners produces two important summary variables: *love* and *money*. The love factor is high for owners who say they are in the business for the love of wine and display hobbyist characteristics. The money factor summarizes a general businesslike attitude in running the winery.

We hypothesize that there are two general types of costly inputs the owner may value above and beyond their effect on profits: those that consumers also value (e.g. quality) and those that consumers do not value (e.g. a winemaker with a French accent). Because we assume monopolistic competition, higher marginal costs will result in higher price, controlling for quality. A preference for quality will cause a utility-maximizing owner to position his wine at the higher end of the quality spectrum. We find empirical support for both hypotheses.

A high value of the *love* variable significantly increases the likelihood that a particular bottle will be high-quality wine, while a high value of the *money* variable decreases it. Indeed,

love is extremely significant in predicting the lowest quality a winery will manufacture, which we interpret to be an indication of the limited tolerance for producing bad wine by those in business for the love of wine. One way to think about the preference of some owners for quality is that their net costs – financial and psychic – are lower than the costs of an identical profit-maximizing firm. UMs will enter where they have a cost advantage, and the PMs have a disadvantage, at the upper end of the quality spectrum. *Money* is highly negatively significant when predicting maximum winery quality, evidence that those motivated by business considerations do not enter the high-quality market segments. We conclude that explicitly recognizing heterogeneity of objective functions among firms in an industry is important in understanding outcomes such as quality provision.

UM competitors will enter the high-quality segment because they are rich enough to buy quality as a consumption good if its financial return is low. We find that concern with financial return is negatively correlated with quality, indicating that those who want to make money are more likely to avoid the high quality segment. We infer from this that hobbyists may lower returns to producers of high quality wines. Our guess is that this is accomplished – despite soft price competition – by UMs bidding for the best land.³⁰ PMs want financial returns and will be unwilling to stay in a low-return segment. Some consumers will gain from the existence of UMs. Those consumers who value the same attributes that UMs like will find those attributes supplied to the market, and perhaps subsidized.

Our simple model of bottle price predicts most of the variation in price and produces the expected signs on all coefficients. Higher quality and higher status wines cost more. Wines produced by larger wineries cost less. We find evidence that owners with strong non-financial motivations choose higher prices for their wines, controlling for quality. This price premium declines with the number of years the winery has been in the owner's family. For example, a second-generation owner with the same value of *love* as a first-generation owner will charge a lower price for the same bottle of wine. This result is inconsistent with *love* measuring unobserved quality, and instead may reflect learning economies that accumulate over the years.

³⁰ The supply response to higher demand is inelastic because the amount of appropriate land is fixed and converting existing land to grape-growing takes several years.

We also find that a winery selling a higher quality ‘sister’ wine charges a slightly higher price for the reference bottle. The profitable positive externality generated by the higher quality wine may justify the continued presence of the multiproduct firm in the high-quality segment.

Our results have implications for several areas of the economics literature. Because we find that different types of owners systematically price differently and the type of owner is correlated with the quality of the wine, hedonic regressions of wine prices will not be correct. An ordinary hedonic pricing regression using data from wineries with different objective functions will consistently mis-specify the cost of the features of a high quality bottle of wine. Our results are also relevant for the traditional strategy literature; for example, the classic strategy of moving first with a large capacity in order to deter entry by competitors will be more expensive and not work as well when those competitors are not maximizing profit. In general, profit-maximizing firms should re-evaluate their standard strategies when competing against UM firms.

The fact that UMs have a lower threshold for profits has clear and important implications for the evolutionary argument to which we alluded at the outset. Rather than PMs driving UMs from the market or selected market segments, the UMs end up being more “competitive” than their PM counterparts. An obvious extension of this empirical research is to actually undertake a dynamic analysis of the entry and exit of firms, incorporating the motivations of owners as the explanatory variables of central analytical interest. Another interesting area for thought and future research lies in how motives of subsequent generations of owners differ from the original owner and the implications for evolution of an industry.³¹ We suspect that the motivations we studied here are not unique to the wine industry. For example, opinion magazines, professional sports teams, films, art galleries, bars, and horse-racing would also seem to be organizations where a large proportion of owners derive utility from some feature of the organization other than its level of profitability.

³¹ If non-financial benefits are not as strong (regression to the mean) for subsequent owners then the objective function of the organization will revert to profit maximization. This sort of pattern seems to describe entry in the software industry, for example, where founders have goals other than profit-maximization, but after selling to shareholders and professional management, the organization changes its behavior and maximizes profits.

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Table Ia. Summary Statistics Dataset of California Wineries							
	Survey Respondents		Full Sample				
Variable	Mean	Obs	Mean	Std. Dev.	Min	Max	Obs
price (nominal \$)	10.7	4750	10.7	5.25	2	75	10079
Quality	.604	4885	.581	.759	0	3	10341
3-yr quality of winery	.440	4885	.411	.452	0	3	10341
Rating	58.0	4885	58.2	40.1	0	94	10341
Status	.528	4885	.501	.416	0	1	10341
3-yr status	.423	4885	.388	.402	0	1	10341
Availability	1.84	4885	1.89	.810	0	3	10341
Drinkability	1.41	4885	1.40	.685	0	3	10341
Irregular	.252	4885	.263	.440	0	1	10341
ready to drink	.321	4885	.319	.466	0	1	10341
Tannic	.034	4885	.032	.176	0	1	10341
Wholesale	.788	4885	.768	.422	0	1	10341
ship out of state	.578	4885	.527	.499	0	1	10341
Export	.349	4885	.308	.462	0	1	10341
number of brands	1.47	4810	1.47	1.18	1	21	9885
number of products	1.30	4861	1.35	.856	1	10	10170
Vineyard acreage	333	4885	253	570.6	0	6401	10341
storage capacity ('000 gal)	705	4885	1,570	16,300	0	430,000	10341
Age	31.4	4269	28.8	33.3	1	158	8930
single owner	.489	4885	.505	.500	0	1	10341
multiple owners	.413	4885	.386	.487	0	1	10341
larger corporation	.136	4885	.136	.343	0	1	10341

Table Ib: Distribution of Observations across Years		
	Survey Respondents*	Full Sample
1981	443	1164
1982	416	1089
1983	194	489
1984	349	838
1985	489	1241
1986	456	1066
1987	534	1255
1988	484	1093
1989	388	940
1990	548	1166

* Survey respondents who report owning their winery in the relevant year.

Table II: Summary Statistics for Surveys

#	question	Upper limit	obs	mean	std dev	min	max
1a	entertain- wine people	Never	180	3.36	1.56	1	6
1b	entertain- non-profits	Never	180	4.22	1.37	1	6
1c	entertain- business	Never	180	4.24	1.65	1	6
2	lose \$ for quality	1million	170	2.07	1.07	1	5
3	sell if higher return	Unlikely	176	4.16	1.24	1	5
4	% wines family name	100%	176	2.97	2.23	1	6
5	invest more if richer	None	177	2.19	1.12	1	4
6	% socialize w/wine	100%	178	4.12	1.37	1	7
7	years family owned	--	170	24.3	22.7	1	143
8	cover costs or profit?	Profit	178	1.98	.149	1	2
8b	target RoR?	No	163	1.55	.499	1	2
9a	motivation-lifestyle	Yes	181	.558	.498	0	1
9b	motivation-entertain	Yes	181	.077	.267	0	1
9c	motivation-community	Yes	181	.309	.464	0	1
9d	motivation-love wine	Yes	181	.591	.463	0	1
9o	motivation-other	Wrote in	181	.448	.499	0	1
9t	total nonfinancial motives	Many	181	1.98	1.32	0	5
10	important family owned?	No	170	1.85	1.04	1	4
11	profits big part of income	Insignif	174	2.36	1.38	1	5
12g	Gallo superior?	Yes	165	5.92	2.56	1	10
12m	Mondavi superior?	Yes	166	7.87	1.64	2	10
12b	Beringer superior?	Yes	165	7.75	1.68	1	10
12s	Sutter superior?	Yes	147	5.61	2.51	1	10
14	copy of survey results?	Yes	173	.86	.353	0	1
	money factor		131	.019	.667	-1.36	2.24
	love factor		131	.014	.672	-1.52	1.19

**Table IIIa: Correlations between Survey Variables and
Correlations between Factors and Selected Variables
(*=significant at 8% level or better):**

	1tot	2	3	4	5	6	7	8b	9tot	9lv	9lf	9ot	10	11	12m
1tot	1														
2	-.24*	1													
3	-.14*	.15*	1												
4	.07	-.11	-.11	1											
5	.08	.02	-.05	-.08	1										
6	-.08	.02	.01	.07	-.23*	1									
7	-.20*	-.07	.09	.20*	-.02	-.03	1								
8b	.20*	-.01	-.04	-.03	.01	-.01	-.06	1							
9tot	-.01	.15*	.12	0	-.05	.17*	-.09	-.01	1						
9lv	.05	.10	.15*	-.05	-.04	.06	-.21*	.06	.72*	1					
9lf	.03	.13*	-.01	.11	.04	.15*	-.05	.01	.63*	.32*	1				
9ot	-.05	.03	.10	.08	-.18*	.06	.09	-.02	.42*	.12	-.03	1			
10	.18*	-.09	-.28*	-.12	.10	-.05	-.12	-.01	-.19*	-.20*	-.02	-.16*	1		
11	.09	-.01	-.02	-.05	.00	-.11	-.25*	.04	-.10	-.17*	-.04	-.07	.10	1	
12m	-.14*	-.09	.08	-.01	.12	.06	.19*	-.20*	-.05	-.02	-.07	-.01	-.14*	-.13*	1
12g	-.08	-.02	-.09	.01	.03	-.04	.31*	-.23*	-.11	-.11	-.15*	.03	.07	-.18*	.55*

	Love	Money	Price	Quality	Status	All correlations significant at 1% or better except (love, status) at 2.7%. N=3241
Money	-0.060	1				
Price	0.137	-0.080	1			
Quality	0.110	-0.084	0.339	1		
Status	-0.039	-0.098	0.212	0.185	1	

Table IIIb: Key for Table IIIa

1tot	Entertain business + entertain nonprofits + entertain wine people
2	willing to lose money for quality
3	unlikely to sell winery for fair value
4	Percentage of wines named after family.
5	Increases in resources would cause little additional investment in winery.
6	Amount of socializing with wine people
7	length of time owned winery.
8b	no specific target rate of return in mind
9tot	sum of motivations checked or written in. One point for each.
9lv	Motivated by love of wine
9lf	Motivated by lifestyle
9ot	other non-financial reason for owning winery written in.
10	Continuing family ownership of winery unimportant
11	winery profits small part of family income.
12m	Mondavi superior
12g	Gallo superior

Table IIIc: Factor Loadings

<i>Survey Variable</i>	<i>Love</i>	<i>Money</i>
entertain wine community	.202	.404
willing to lose money for quality	.116	-.295
unlikely to sell winery for fair value	.040	-.462
percentage of wines named after family.	.006	.107
increases in resources would cause little additional investment in winery.	.005	.218
amount of socializing with wine people	-.044	-.093
length of time have owned winery	-.242	-.110
no specific target rate of return in mind	.489	.049
motivated by love of wine	.403	-.074
continuing family ownership of winery unimportant	-.127	.461
winery profits small part of family income.	-.009	-.001
Gallo superior	-.499	.083

**Table IV: Ordered Probit Regression of Bottle and Vintage Quality Rating
(rating takes on four values only, 0-3)**

Dependent Variable:	Bottle Rating	Bottle Rating	Avg Winery Rating	Minimum Winery Rating	Maximum Winery Rating
Love Factor	---	.296* (.047)	.088* (.034)	.233* (.079)	.012 (.060)
Money Factor	---	-.090* (.038)	-.033 (.031)	.105 (.073)	-.207* (.057)
Willing to lose money for quality	.095* (.020)	---	---	---	---
Own winery because love wine	.244 * (.049)	---	---	---	---
No further investment if more resources	.098 * (.021)	---	---	---	---
Think Gallo is superior winery	-.042 * (.011)	---	---	---	---
Age	-.015* (.004)	-.009* (.004)	-.009* (.003)	-.031* (.009)	-.007 (.006)
Age Squared	9.5E-05* (2.9E-05)	5.0E-05 (3.1E-05)	5.7E-05* (1.9E-05)	.00020* (.00007)	3.6E-05 (4.5E-05)
Varietal dummies?	Yes	yes	No	no	no
Vintage dummies?	Yes	yes	Yes	yes	yes
Appellation dummies?	Yes	yes	No	no	no
Pseudo R ²	.085	.082	.065	.069	.033
Observations	3195	2608	811	811	811

The sample in columns 1 & 2 is bottle quality of respondents who owned their winery for the relevant observation. Average, minimum and maximum winery qualities are defined within a vintage. In columns 3-5 each winery-vintage combination that responded to the survey and owned the winery within three years after the vintage has one observation in the sample.

Table V: Financial Concerns Explain Choice to Produce Low Quality

Dependent Variable:	Minimum Winery Quality	Winery Produces 0-level Quality?
No Specific Rate of Return in Mind	.238* (.103)	-.238* (.107)
Willing to lose money for quality	.040 (.045)	-.018 (.047)
No further investment if more resources	.182* (.043)	-.197* (.046)
Entertains	-.044 (.031)	.035 (.032)
Unlikely to sell winery	.107* (.046)	-.103* (.047)
Important winery remains in family	.014 (.049)	-.002 (.051)
Own winery because love wine	.080 (.103)	-.027 (.107)
Age	-.040* (.009)	.040* (.010)
Age Squared	2.6E-04* (7.3E-05)	2.5E-04* (7.4E-05)
Vintage dummies?	yes	yes
Pseudo R ²	.102	.106
Observations	905	911
range of dependent variable	0-3	0 or 1
Minimum winery quality is defined within a vintage. Each winery-vintage combination that responded to the survey and owned their winery for the relevant observation is in the sample. * indicates significance at the 5% level or less.		

Table VI: Regressions of Price on Wine and Winery Characteristics

Dependent variable: ln(price)	Whole Sample N=8462		Wineries who Returned Survey N=4167	
variable	coefficient	std err	coefficient	std err
age	-.008*	.001	-.008*	.002
age squared	3.6E-05*	5.5E-06	3.7E-05*	8.1E-06
ln age	.113*	.017	.092*	.025
Quality level 0 (3 omitted)	-.283*	.023	-.324*	.032
quality level 1	-.192*	.022	-.239*	.031
quality level 2	-.087*	.024	-.095*	.033
3yr quality of winery	.143*	.009	.146*	.013
rating of vintage	-.0005	.0004	-.0005	.0005
status	.075*	.009	.094*	.013
3yr status	.027*	.012	.020	.018
availability	.059*	.005	.051*	.008
drinkability	.083*	.006	.090*	.009
irregular	-.088*	.021	-.082*	.031
ready to drink	-.042*	.016	-.021	.023
tannic	.049	.031	.085	.045
wholesale	-.009	.008	.0004	.013
shipout	-.028*	.006	-.024*	.010
number of brands	-.020*	.005	-.038*	.015
brands squared	.001*	.0003	.003	.002
acreage	-.00004*	.00001	.00005	.00003
acreage squared	2.9E-09	2.7E-09	-2.1E-09	9.6E-09
storage capacity	-4.0E-06*	9.4E-07	-3.4E-05*	8.8E-06
Storage capacity squared	8.8E-12*	2.4E-12	7.8E-10*	2.4E-10

Varietal dummies: Cabernet Sauvignon, Chardonnay, Marsanne, Voigner, Merlot, Pinot Noir are significantly positive. Negative coefficients include Gamay, White Zinfandel, Chenin Blanc

Vintage dummies: One set of vintage dummies for all varietals. Peak coefficients are 1975-83.

Year dummies: Increasing over time, especially in late 80's.

Adjusted R² = .640 and .643 respectively. Robust standard errors reported. Significance at standard levels (5% two-tail test) is indicated by *.

**Table VII: Regression of Log Price on Factors
as well as wine and winery characteristics**

Dependent variable: ln(bottle price)	1	2	3	4
Money Factor	-.0232* (.0090)	-.0355* (.0092)	-.0046 (.0185)	-.0261 (.0190)
Love Factor	.0417* (.0090)	.0398* (.0090)	.0806* (.0135)	.0720* (.0137)
additional outside resources would not result in more winery investment	---	.0291* (.0056)	---	.0211* (.0059)
Money*Years Owned by Family	---	---	-.0013* (.0006)	-.0008 (.0006)
Love*Years Owned by Family	---	---	-.0023* (.0004)	-.0020* (.0004)
Years Owned by Family	---	---	-.0028* (.0004)	-.0024* (.0004)
Quality level 0	-.3281* (.0381)	-.3210* (.0384)	-.3121* (.0381)	-.3088* (.0386)
Quality level 1	-.2467* (.0376)	-.2430* (.0379)	-.2343* (.0376)	-.2332* (.0380)
Quality level 2	-.0942* (.0406)	-.0924* (.0409)	-.0871* (.0407)	-.0865* (.0411)
Adj. R ²	.660	.663	.676	.677
N	2637	2637	2637	2637
Dollar change in mean bottle price when money or love factor increases one standard deviation from zero. (-) money factor / (+) love factor	-\$ 0.16 / + \$ 0.30	-\$ 0.25 / + \$ 0.29	-\$ 0.03 / + \$ 0.55	-\$ 0.18 / + \$ 0.49
<p>The full sample is respondents who owned their winery for the relevant observation. The sample size drops from Table III to this table because of missing observations. (love and money cannot be constructed if a survey is missing responses.) All explanatory variables from Table II are included in all regressions, but their coefficients are not reported to conserve space. The <i>love</i> and <i>money</i> factors in columns 3 and 4 are constructed without family ownership years; it enters separately and in interactions with <i>love</i> and <i>money</i>. * indicates significant at the 5% level, two-tail test.</p>				

Figure 1

Average Rating of Winery's Product Plotted Against the Money Factor
(one point for each respondent)

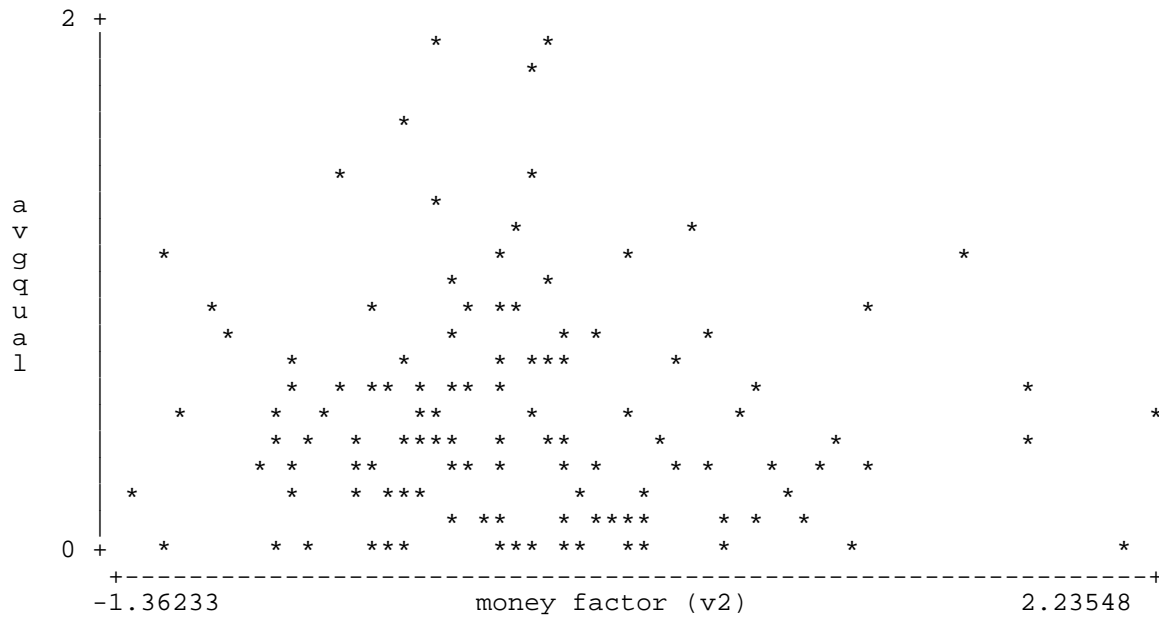
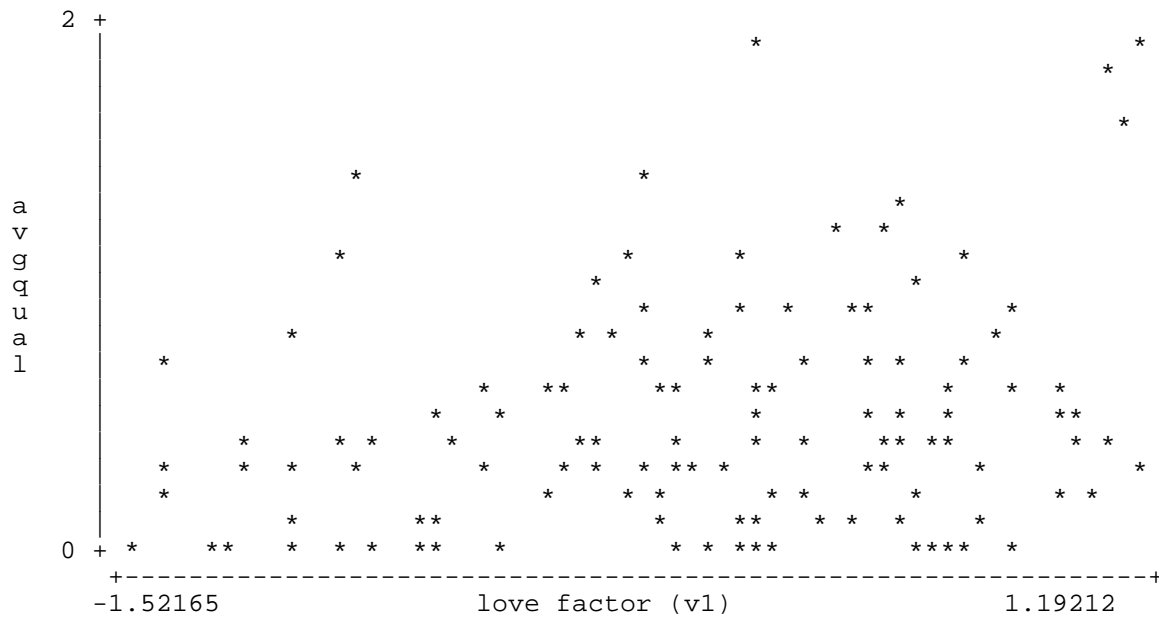


Figure 2

Average Rating of Winery's Product Plotted Against the Love Factor
(one point for each respondent)



Stanford Business School Survey of Winery Owners

Name of respondent: _____

Title and Winery Name: _____

Please provide current responses to the questions if your views have changed over time.

1. How often does your winery provide activities or a site for entertaining (either individually or in groups)?

a) members of the wine community? (e.g growers, producers, buyers, service providers)

- at least several times a week
- several times a month
- once a month
- several times a year
- once a year
- never

b) on behalf of local groups or non-profit organizations?

- at least several times a week
- several times a month
- once a month
- several times a year
- once a year
- never

c) non-wine related business associates? (e.g. business lunches, meetings, events)

- at least several times a week
- several times a month
- once a month
- several times a year
- once a year
- never

2. Suppose that someone develops an innovation that would significantly improve the quality of the wines that you produce but is so costly you would lose money by purchasing the innovation. (*The price of the innovation is greater than the improvement in wine quality is worth in the marketplace.*) How much money would you be willing to lose on the investment in order to significantly improve the quality of your wines?

- None
- between \$1 and \$10,000
- between \$10,000 and \$100,000
- between \$100,000 and \$1,000,000
- more than \$1,000,000

3. Suppose you were offered a fair market value for your vineyard in cash and you knew you could earn a higher rate of return in the stock market. How likely is it that you would sell?

- Very likely
- somewhat likely

neither likely nor unlikely
somewhat unlikely
very unlikely

4. Approximately what percentage of your wines are named after your family?

Less than 10%
10%-25%
26%-50%
51%-75%
75%-99%
100%

5. If your income or revenue from non-winery resources were suddenly bigger (times 10, for example) how much additional investment or improvements to your winery would you undertake?

significant additional investment or improvement
some additional investment or improvement
a little additional investment or improvement
additional resources would have no effect on winery investment or improvement

6. Which category below best reflects the percentage of your socializing in the last six months that has been with "wine people" and wine-related people?

none
less than 10%
10%-25%
26%-50%
51%-75%
75%-99%
100%

7. How long have you or your family owned your winery? _____ years

8. What are your financial goals for your winery?

a) cover costs
b) cover costs and earn some profit

If you answered b), do you have a rate of return in mind? yes no

If so, what rate of return are you happy achieving? _____

9. Sometimes people have non-financial motives for owning a winery. Circle any of the following non-financial motives that are important to you.

lifestyle associated with owning a vineyard
being part of the wine community
entertaining for non-wine-related business
love of wine

Are there any other important reasons why you own your vineyard? _____

10. How important is it to you that your winery continue to be owned by a member of your family?

- very important
- somewhat important
- not very important
- completely unimportant

11. How would you characterize the importance of your winery's profits? Profits from your winery are?

- your most important source of family income
- a significant source of family income
- part of family income
- a small part of family income
- do not contribute to family income

12. We would now like you to briefly consider what it means to be a superior winery. Please evaluate the following wineries on a 10 point scale as to how well each meets your definition of a superior winery, where a '1' denotes a poor or inferior winery and a 10 denotes an outstanding or superior winery.

- Gallo?
- | | | | | | | | | | |
|------|---|---|---|---------|---|---|---|----------|----|
| poor | | | | average | | | | superior | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
- Mondavi?
- | | | | | | | | | | |
|------|---|---|---|---------|---|---|---|----------|----|
| poor | | | | average | | | | superior | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
- Beringer?
- | | | | | | | | | | |
|------|---|---|---|---------|---|---|---|----------|----|
| poor | | | | average | | | | superior | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
- Sutter Hill?
- | | | | | | | | | | |
|------|---|---|---|---------|---|---|----------|---|----|
| poor | | | | average | | | superior | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

13. If your views on the above questions - particularly questions 8 and 9 -- have changed significantly over the time you have owned your winery, please let us know how (with approximate dates).

14. Would you like to receive a comparison of your survey responses to those of your peers in the industry?

Yes No