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Organizational Structure and Operation of the Illinois Wine Industry

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Organization of the Illinois Wine Industry

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Abstract

This study examines vertical coordination in an emerging Illinois wine industry. Results generally corroborate earlier findings that quality matters, as temporal issues related to grape perishability increase the probability written contracts are used to procure grapes and decrease reliance on informal agreements. Hold-up concerns related to sourcing adequate quality grapes and at risk investments winemaking equipment displace informal contracts with in-house production. Older wineries also rely more on their own vineyards, and larger ones require additional outside supplies. There is also some evidence that a few wineries outsource wine production activities to more experienced and larger wineries.

Keywords: contract, grapes, vertical integration, wine

Organizational Structure and Operation of the Illinois Wine Industry

Quality is a key competitive factor in the wine industry (c.f., Landon and Smith, 1998; Dubois and Nauges, 2007; Ashenfelter, 2007; Castriota and Delmastro, 2009), and several studies applying organizational economics frameworks (Grossman and Hart, 1986; Williamson, 1975; 1979) identify quality motivations for marketing and procurement decisions in established wine regions (e.g., Goodhue, Heien, Lee, and Sumner, 2003; Fraser, 2005; Fernández-Olmos, Rosell-Martínez, and Espitia-Escuer, 2009; Fares and Orozco, 2012; Franken, 2012).[1] However, the extent to which these motives apply in emerging wine markets is unknown, as is their relative reliance on vertical coordination mechanisms (i.e., in-house production and contractual and arms-length spot transactions).

This study examines these issues for an emerging wine industry in Illinois, which grew from 12 wineries in 1997 to over 90 wineries and 450 vineyards with a total economic impact of $319 million (MFK Research, LLC, 2007). Responses to a 2012 survey of Illinois wineries are analyzed, providing insight into the use of procurement and marketing mechanisms by these businesses. The preliminary results, while based on a small sample, are largely corroborative of findings for more established regions.

[1] The grape and wine industry is an ideal sector for studying vertical coordination for several reasons (Goodhue, Heien, Lee, and Sumner, 2003). Grape quality is critical to a winery's reputation for wine making, and as a perishable product, wine grapes require close coordination between growers and wineries at harvest time. Additionally, there is considerable product differentiation along with variation in types of grapes and wines, size of businesses, and vertical coordination mechanisms employed.

The paper proceeds as follows. Literature on vertical coordination in the wine grape supply chain and organizational theory are reviewed in the next section, followed by the research design, including data, measures, and empirical methods employed. Results are then presented and discussed, and the paper concludes with implications and suggestions for further research.

Relevant Literature and Hypothesis Development

Extant literature on the organization of wine-grape supply chains draws heavily on organizational economics and transaction cost economics in particular (Goodhue, Heien, Lee, and Sumner, 2003; Fraser, 2005; Fernández-Olmos, Rosell-Martínez, and Espitia-Escuer, 2009).

Goodhue, Heien, Lee, and Sumner (2003) find that use of written contracts in California is significantly more likely for more experienced growers, those with larger acreage, those producing higher quality (i.e., high priced) grapes. Fraser (2005) also finds a higher probability of use of written contracts among larger and more experienced growers in Australia. For larger producers and those raising higher quality grapes, the value of potentially appropriable quasi-rents is sufficient to justify contracting costs. Both studies find that wineries have more influence on production practices in contracts for higher quality grapes, whereas contracts for lower quality grapes rely on quality metrics and financial incentives. Building on this research, Franken (2012) finds that perceived difficulty in measuring grape quality decreases the probability that informal verbal contracts are used and increases reliance on formal contracts for wine-grape trade in California. According to the organizational economics literature (Mahoney 1992), if quality measurement is difficult or costly, then contract provisions can stipulate *best practices* known to yield desired quality if their use is easily verified (i.e., the task is

programmable). If both, quality is difficult to measure and production practices do not correlate with quality or are not easily verified, in-house production may be necessary. We hypothesize:

H1 Measurement difficulty is positively associated with sophistication of procurement.

Similarly, Fernández-Olmos, Rosell-Martínez, and Espitia-Escuer (2009) find that Spanish wineries' choices to predominately make rather than buy grapes are positively related to wine quality (i.e., wine differentiation of *reserva* and *crianza* wines from *guarantee of origin* wines), and also to investments in specialized assets dedicated to grape growing and the level of behavioral and environmental uncertainty involved. The authors suggest that a lack of statistical significance for investments in assets supporting winemaking reflects that wineries' revenues are increasingly not just from winemaking but also from wine tourism. According to transaction cost economists (e.g., Williamson, 1975; 1979), such investments tend to lead to vertical integration as a mechanism to protect the value of these investments from appropriation in hold-up situations with opportunistic trade partners. Thus, we hypothesize:

H2 The potential for hold-up problems is positively associated with vertical integration.

Fernández-Olmos, Rosell-Martínez, and Espitia-Escuer (2009) also find that vertical integration of Spanish wineries is negatively related to their size, as proxied by average capacity from 2002 to 2004, perhaps due to a need to source large amounts of grapes. Hence, we hypothesize:

H3 Size is positively associated with out-sourcing production of inputs.

In addition to hold-up problems stemming from specialized investments, the organizational economics literature also recognizes potential hold-up problems related to temporal specificities

such as product perishability (e.g., Williamson, 1975). In the context of the wine industry, Goodhue, et. al (2003) identify that grape perishability compounded by the relatively small number of wineries in San Joaquin compared to other regions of California (Goodhue, et. al, 2003) motivates greater use of formal contracts by growers in that region. That is, with fewer buyers of perishable grapes, a winery could potentially renege on an informal agreement with a grower or accept delivery only at a lower price than previously agreed upon. Similarly, a winery may prefer formal written contracts to specify timely harvest and delivery of perishable grapes and mechanisms to rectify deviances from agreed upon conditions. Therefore, we hypothesize:

H4 Temporal specificity is positively associated with formal contracting.

These hypotheses are empirically tested as described in the following research design section.

Research Design

Research Context

We analyze a data on the proportion of grapes produced in-house or procured via arms-length spot/cash transactions and informal or formal contracts by 17 Illinois wineries. The data are from a 2012 survey of Illinois wineries. See the Appendix for a copy of the survey.

Mailing addresses for 86 wineries were obtained from a list compiled by the Illinois Grape Growers and Vintners Association (IGGVA) in *The Illinois Wineries Guide*. Two mailings of the one-page survey were sent to the wineries in February and April of 2012. Surveys sent to six wineries were returned "address unknown" as some wineries appear to have gone out of business—a fact confirmed for at least two of these businesses. Overall, 25 surveys

were returned, constituting a 31% response rate, with 17 complete responses available for this analysis.

Measures

Procurement methods (i.e., *In-House Production*, *Formal Written Contract*, *Informal Oral Contract, Spot*) are measured as the percentage of grapes traded via that method (Figure 1). Though not reported here, this information is also available separately for grapes for white wine and red wine. The only significant difference in average use of procurement method across grape type is a 4.25% difference in the percentage of grapes sourced from the wineries' own vineyards (52.50% for red and 48.25% for white).

Several explanatory variables are measured directly by survey items. *Years* is how long the respondent's company has been in business and approximates experience or tenure. *Size* is annual sales of cases of wine. The available responses appear to be fairly representative of Illinois wineries, as evidenced by our data (Table 1) with statistics reported by prior studies. According to MFK Research, LLC (2007), 80% of Illinois wineries produce less than 2,100 cases per year—a sales volume not exceeded by 76% of respondents to this survey (48% sell less than 1,000 cases annually). Survey respondents' wine production on average was 43% white, 30% red, and 22% blend, compared to 47% white, 34% red, & 16% other fruit reported by Shoemaker, Campbell, and Bartanen (2006). The same study indicates that 48% of Illinois wineries have been in business five or less years and 84% have been for 10 or less years, compared to an average of eight years in business for our survey. *Measurement ease* is survey participants' responses on a Likert scale of one (strongly disagree) through five (strongly agree) to the question, "The quality attributes of grapes are easily measured." Other scale survey items

are used in development of factor analytic measures that are only indirectly observable as described below.

Factor analysis (Bollen 1989; Hair, et al. 1995; Thompson 2004) of survey items is used to limit error in measurement of conceptual variables like the potential for hold-up and temporal specificities noted in hypotheses H2 and H4. This process capitalizes on common correlation among observable variables. For instance, notable correlation among survey items regarding the ability to source adequate quality grapes, find alternative suppliers, and earn satisfactory returns on winemaking equipment and facilities may reflect potential for hold-up, while survey items regarding timely delivery of grapes and their perishability also appear related (Table 2). Such relationships between relevant items are summarized as a smaller set of more parsimonious variables (eigenvectors called factors) that conserve degrees of freedom and improve power against Type II error in subsequent regression analyses (Thompson 2004). Following the conventional "K1"rule, we identify notable factors possessing characteristic roots (eigenvalues) greater than one (Thompson 2004). The analysis yields two factors— *Temporal specificity* comprising impacts of not having grapes when they are ready or when they are needed and *Hold-up* consisting of availability of adequate quality grapes and alternative suppliers and ability to realize a return on winemaking equipment and facilities if existing suppliers became unavailable. (Complete results available from authors upon request.) Cronbach's (1951) alphas of 0.82 and 0.58, respectively, indicate that these measures are fairly reliable, as values in excess of 0.70 are ideal (Streiner and Norman 1995).

Notably, the *Hold-up* and *Measurement difficulty* variables are reverse coded in relation to original survey items (see Appendix) for the following regression analysis so that higher

values reflect greater hold-up potential and measurement difficulty, which permits more direct testing of hypotheses H2 and H1, respectively.

Empirical Methods

The proportion of a crop procured or marketed by a particular method, say formal written contracts, may be estimated using Tobit regressions. The log-likelihood for the Tobit model contains probabilities of nonuse of contracts from a Probit regression in the first term and a classical regression for positive amounts contracted in the second term:

$$\ln L = \sum_{\alpha_i=0} \ln \Phi\left(-\frac{\beta'_\alpha x_i}{\sigma}\right) + \sum_{\alpha_i>0} \ln\left[\frac{1}{\sigma}\phi\left(\frac{\alpha_i - \beta'_\alpha x_i}{\sigma}\right)\right], \tag{1}$$

where $\Phi(\bullet)$ is the standard normal probability density function, $\mathbf{x}_i$ and β_α are vectors of independent variables and coefficients, σ is the standard deviation, and α_i denotes the proportion contracted.[2] Following Katchova and Miranda (2004), α_i is not constrained from above since a producer conceivably may contract more than the actual *ex post* production. Under the Tobit formulation, the independent variables and associated coefficients are constrained to be the same for the contract adoption and proportion contracted decisions. Cragg's (1971) less restrictive hurdle or two-step model does not require the variables and coefficients for both decisions to be the same. The log-likelihood is the sum of the log-likelihood of a Probit regression (the first two terms) and the log-likelihood of a truncated regression (the second two terms) and is given by

$$\ln L = \sum_{c_i=0} \ln \Phi(-\gamma' z_i) + \sum_{\alpha_i>0} \left\{ \ln \Phi(\gamma' z_i) + \ln\left[\frac{1}{\sigma}\phi\left(\frac{\alpha_i - \beta'_\alpha x_i}{\sigma}\right)\right] - \ln \Phi\left(\frac{\beta'_\alpha x_i}{\sigma}\right)\right\}, \tag{2}$$

[2] The proportion contracted α_i equals the latent variable α_i^* for $\alpha_i^* = \beta'_\alpha X_i + \varepsilon_{\alpha i} > 0$ and equals zero otherwise, where $\varepsilon_{\alpha i}$ are independently and normally distributed residuals with mean zero and variance σ^2.

where $\mathbf{z}_i$ and γ are vectors of independent variables and coefficients pertaining to contract adoption and, and as before, $\mathbf{x}_i$ and β_i are vectors of independent variables and coefficients pertaining to the proportion contracted. When $\mathbf{z}_i = \mathbf{x}_i$ and $\gamma = \beta_\alpha/\sigma$, equations (1) and (2) are equivalent. From a practical standpoint, Tobit models seem particularly appropriate when (nearly) all observations in the sample are indicative of use or adoption. The hurdle model is intuitive for cases where choices of adoption and proportional use are made sequentially. For our purposes, given the properties of our small sample, binary probit models of adoption of particular procurement methods and tobit models of their proportional use are appropriate.

Regression Results for Grape Procurement Methods

Tables 3 through 6 contain marginal effects of regressions for various procurement methods corresponding to out-sourced grape production. Due to limited survey responses and the relative utilization of procurement methods represented therein (Figure 1), hurdle models are not feasible for each procurement method, an in some cases only the adoption decision (probit) or the proportional use decision (tobit) is relevant. Except when otherwise indicated, the following results pertain to total grape procurement (for red and white wine). Notably, and in contrast to prior findings by Franken (2012), *Measurement difficulty* is not statistically significant in any of the regressions, leading to no support for hypothesis H1. Support for other hypothesis is obtained, as described below.

Very few of the responding wineries do not have a working vineyard (Figure 1), rendering the adoption decision somewhat moot. Hence, the analysis focuses on the degree to which wineries rely on production from their own vineyard. Marginal effects for tobit regressions indicate that proportion of grapes procured from wineries' own vineyards is

negatively related to size (Table 3). For instance, selling an additional 100 cases decreases the proportion procured "in-house" by 2% (Table 3), increases the proportion secured through informal (verbal/handshake) contracts by 2% (Table 5), and increases the probability that grapes are purchased through cash or spot transactions by 2% (Table 4).[3] The need to source grapes from outside one's own vineyard is partly driven by size, which is consistent with hypothesis H3.

Wineries with greater *Hold-up* concerns related to availability of alternative grape suppliers and an ability to realize returns on winery equipment/facilities in their absence are expected to rely more on formal than informal procurement methods. For instance, wineries with greater concern of *Hold-up* grow 19% more of grapes, for white wine in particular, themselves (Table 3). This finding is consistent with hypothesis H2. Greater concerns for *Temporal specificity* related to the ability to source grapes when they are needed and when they are ready (grape perishability) increase the probability that formal written contracts are used by over 30% (Table 6), which is consistent with hypothesis H4.

Other Survey Results

The survey also collected information regarding wine prices, contract terms, and the degree to which wine production is performed by wineries or outsourced. Retail prices for responding wineries' highest quality red, white, and blush wines average $19.40, $16.23, and $14.20 per bottle and best-selling red, white, and blush wines average $14.67, $14.25, and $13.10 per bottle. Contracts usually are in terms of volume of grapes but some also specify acreage, and the most common contract provisions deal with sugar (brix), acidity, and defects (mold/rot), with only a

[3] The coefficient on *Cases* in spot/cash market regressions for all grapes is nearly statistically significant (*p*-value = 0.107).

few contracts specifying viticultural practices and conflict resolution clauses. Each of the responding wineries has its own wine-making equipment and wine-maker. However, there is evidence that some wineries outsource some wine production activities as well, with 30% of the survey respondents reporting that they produce wine for or rent their facilities and/or equipment to other wineries. The wineries that offer these services tend to be more experienced and larger wineries as evidenced by marginal effects for *Years* (*p*-value = 0.10) and *Cases* (*p*-value = 0.12) from a binary Probit regression presented in Table 7.

Conclusions

This study examines vertical coordination issues for an emerging wine industry in Illinois. While the results are intuitive and in line with organizational economics theories on vertical coordination, they should be interpreted with some caution due to the small sample size obtained by the survey. Although the findings deviate from prior research in some specific cases (i.e., no statistically significant relation between grape procurement methods and perceived difficulty in measuring grape quality), the results in general corroborate earlier findings that quality matters, as evidenced by the importance of temporal issues related to grape perishability. Specifically, these temporal issues appear to increase the probability that formal written contracts are used to procure grapes. Hold-up concerns related to availability of adequate quality grapes and alternative suppliers and at risk investments winemaking equipment have similar positive effects on reliance on in-house grape production for white wine in particular. Notably, relative reliance on a winery's own vineyard and outside suppliers is largely driven by the winery's size, with larger wineries requiring additional grapes from outside suppliers.

The study also provides some insight regarding average wine prices, contract provisions, as well as some evidence that a few wineries outsource wine production activities to more experienced and larger wineries. The empirical evidence on these points in particular is weak, due to the limited number of survey responses available for analysis. For these reasons, not many clear-cut observations to be drawn regarding factors contributing to the use of various contract provisions either. Further research along these lines is warranted.

Table 1. Summary Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Years	24	8.04	5.19	1.50	25.00
Case_red	18	430.50	364.37	32.00	1000.00
Case_white	18	611.28	832.15	40.00	3000.00
Case_blend	17	318.00	414.18	5.00	1500.00
Case_all	19	1413.58	1490.37	99.00	5000.00
Spot_all	22	0.07	0.21	0.00	1.00
Informal_all	22	0.30	0.36	0.00	1.00
Formal_all	22	0.13	0.25	0.00	1.00
Grow_all	22	0.50	0.43	0.00	1.00
Measurement ease	23	4.30	0.70	3.00	5.00
Buy quality	22	3.09	1.15	1.00	5.00
Timing	21	3.81	1.29	1.00	6.00
Perishability	21	3.57	1.21	1.00	5.00
Suppliers	21	3.43	1.12	1.00	5.00
Return	21	3.24	1.30	1.00	5.00

Table 2. Correlations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Years	1.00														
(2) Case_red	0.37	1.00													
(3) Case_w	0.36	0.72	1.00												
(4) Case_b	0.31	0.88	0.85	1.00											
(5) Case_total	0.37	0.88	0.96	0.95	1.00										
(6) Spot_a	-0.42	-0.21	-0.07	-0.14	-0.13	1.00									
(7) Informal_a	0.06	0.79	0.45	0.74	0.64	-0.26	1.00								
(8) Formal_a	0.28	-0.05	0.04	-0.09	-0.01	-0.14	-0.25	1.00							
(9) Grow_a	0.03	-0.55	-0.39	-0.52	-0.49	-0.32	-0.57	-0.38	1.00						
(10) Measurement ease	-0.07	0.45	0.32	0.38	0.39	-0.10	0.54	-0.37	-0.17	1.00					
(11) Buy quality	-0.16	0.29	0.10	0.08	0.15	0.25	0.30	0.02	-0.45	0.16	1.00				
(12) Timing	0.43	0.34	0.46	0.52	0.48	-0.09	0.41	0.21	-0.47	0.02	-0.12	1.00			
(13) Perishability	0.33	0.11	0.04	-0.02	0.04	-0.02	0.09	0.41	-0.36	-0.17	0.30	0.63	1.00		
(14) Suppliers	-0.43	-0.31	-0.53	-0.53	-0.51	0.31	-0.09	-0.07	-0.07	-0.18	0.38	-0.55	-0.17	1.00	
(15) Return	-0.31	0.20	0.08	0.05	0.10	0.19	0.34	-0.20	-0.30	0.01	0.38	-0.06	-0.01	0.61	1.00

Table 3. Marginal Effects for Tobit Regressions of Reliance on In-House Grape Production.

	Red (Tobit)	White (Tobit)	All Grapes (Tobit)
Years	0.0488	0.0203	0.0312
	(0.0321)	(0.0289)	(0.0298)
Cases	-0.0012***	-0.0003**	-0.0002**
	(0.0004)	(0.0001)	(0.0001)
Measurement	-0.3031	-0.0876	-0.0915
difficulty	(0.2055)	(0.1523)	(0.1565)
Temporal	-0.0968	-0.1330	-0.1529
	(0.1179)	(0.0950)	(0.0957)
Hold-Up	0.1051	0.1931*	0.1553
	(0.1272)	(0.1094)	(0.1076)
R^2	0.2832	0.2962	0.2764
N	15	16	17

Note: Dependent variable equals percentage of grapes procured from own vineyard.
*,**,*** denote statistical significance at the 10%, 5%, 1% level.

Table 4. Marginal Effects for Binary Probit Regressions of Spot/Cash Grape Procurement.

	Red	White	All Grapes
Years	-0.0575*	-0.0305	-0.0321
	(0.0348)	(0.0413)	(0.0419)
Cases	0.0005*	0.0001	0.0002
	(0.0003)	(0.0002)	(0.0001)
Measurement	0.1248	-0.0417	0.1601
difficulty	(0.1702)	(0.2007)	(0.2090)
Temporal	0.0339	-0.0244	0.0980
	(0.0955)	(0.1197)	(0.1383)
Hold-Up	0.0337	0.0716	-0.0875
	(0.0821)	(0.1370)	(0.1345)
R^2	0.2198	0.0739	0.1649
N	15	16	17

Note: Dependent variable equals one if any grapes are procured in the spot/cash market and zero otherwise.
*,**,*** denote statistical significance at the 10%, 5%, 1% level.

Table 5. Marginal Effects for Regressions of Informal Contract Grape Procurement.

	Red		White		All Grapes	
	Probit	Tobit	Probit	Tobit	Probit	Tobit
Years	–	-0.1042***	-0.0070	-0.0129	-0.0488	-0.0459
		(0.0389)	(0.0187)	(0.0403)	(0.0379)	(0.0370)
Cases	–	0.0015***	0.0005	0.0003*	0.0002	0.0002**
		(0.0004)	(0.0004)	(0.0002)	(0.0001)	(0.0001)
Measurement	–	0.0266	0.0271	-0.2165	-0.0612	-0.1880
difficulty		(0.1782)	(0.0835)	(0.1987)	(0.1758)	(0.1745)
Temporal	–	0.2554*	-0.0228	0.0760	0.1415	0.1695
		(0.1353)	(0.0488)	(0.1320)	(0.1355)	(0.1116)
Hold-Up	–	0.0252	0.0740	-0.1147	0.2835**	-0.0250
		(0.0894)	(0.0944)	(0.1320)	(0.1369)	(0.1135)
R^2	–	0.6845	0.3196	0.1888	0.3555	0.3007
N	15	15	16	16	17	17

Note: Dependent variable for binary Probit regressions equals one if any grapes are procured using informal contracts and zero otherwise. Dependent variable for truncated regressions equals percentage of grapes procured through informal contracts. *,**,*** denote statistical significance at the 10%, 5%, 1% level.

Table 6. Marginal Effects for Binary Probit Regressions of Formal Contract Grape Procurement.

	Red	White	All Grapes
Years	–	0.0127	0.0513
		(0.0217)	(0.0532)
Cases	–	0.0001	-2.94×10^{-6}
		(0.0002)	(0.0001)
Measurement	–	0.0253	-0.0273
difficulty		(0.1333)	(0.1756)
Temporal	–	0.3308*	0.3889*
		(0.1781)	(0.2335)
Hold-Up	–	0.0372	0.0538
		(0.1217)	(0.1578)
Sigma	–		
R^2	–	0.4207	0.6061
N	15	16	17

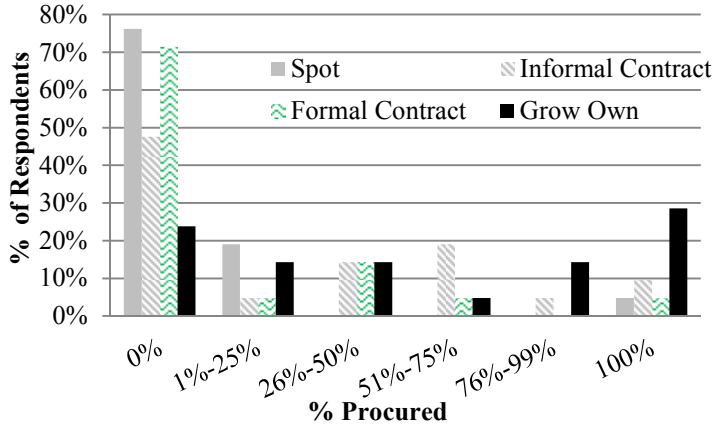
Note: Dependent variable equals one if any grapes are procured using formal contracts and zero otherwise. *,**,*** denote statistical significance at the 10%, 5%, 1% level.

Table 7. Marginal Effects for Binary Probit Regressions of Private Label Wine Production or Rental of Winery Equipment.

	Marginal Effect
Years	0.0672*
	(0.0408)
Cases	0.0002
	(0.0001)
R^2	0.4554
N	21

Note: Dependent variable equals one if winery produces wine for or rents winemaking equipment to other wineries and zero otherwise.
*,**,*** denote statistical significance at the 10%, 5%, 1% level.

Figure 1. Grape Procurement Methods.



Appendix

SURVEY

1. How many years have you been in business _____ & in which zip code _____?

	Red Wine	**White Wine**	**Blush/Blend**
2. How many cases of wine did you sell in 2010?	_____	_____	_____
3. What is the retail price of your best quality wine?	_____	_____	_____
4. What is the retail price of your best-selling wine?	_____	_____	_____
5. What percentage of grapes or juice do you (Note: should sum to 100% for each wine type.)			
- Acquire in spot/cash markets as needed?	_____%	_____%	_____%
- Procure via oral contract?	_____%	_____%	_____%
- Procure via written contract?	_____%	_____%	_____%
- Produce yourselves?	_____%	_____%	_____%
Sum for wine type:	100% of Red	100% of White	100% of Blend

If you do not use contracts, please skip to question 9.

6. How is contract price determined? _____

7. Are your contracts for: □ 1 year, □ multiple years (how many? _____).

8. Your contract includes: □ Specific acreage, □ Specific quantity (tonnage, gallons)
(check all that apply)
□ Disagreement resolution clause, □ Viticultural practices clause

Bonuses/Penalties for: □ sugar (brix), □ acidity, □ defects (mold, rot)

9. Do you own wine-making equipment/facilities or rent from another winery?..... □ Own □ Rent

10. Do you employ a master wine-maker or rent the services of another winery?..... □ Employ □ Rent

11. Do you produce wine for or rent your facilities/equipment to other wineries?..... □ Yes □ No

Please indicate your level of agreement/disagreement...	***Strongly Disagree***				***Strongly Agree***
12. The quality attributes of grapes are easily measured.	1	2	3	4	5
13. It is easy to buy grapes of adequate quality.	1	2	3	4	5
14. It adversely affects the profitability of my winery if					
- I don't have grapes when I need them.	1	2	3	4	5
- I don't have grapes when the grapes are *ready*.	1	2	3	4	5
15. If I could not source grapes from my primary suppliers:					
- I could easily find alternative suppliers.	1	2	3	4	5
- I could still earn same return on my equipment/facilities.	1	2	3	4	5

Thank You! Would you like to receive a copy of our research results? □ Yes □ No

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