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Winery Integration Strategies in the Mid-South and Mid-Atlantic States

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Winery numbers in the Mid-South and Mid-Atlantic States have increased substantially in recent years. This paper examines the integration and sourcing strategies utilized by these wineries. Contracting is considered, along with a mix of other less formal kinds of interactions between wineries and grape growers. While the standards for interaction within this regional value chain are still forming, there is evidence that winery age and, to a lesser extent, varietal focus influences the extent of outsourcing. An index is constructed to examine factors influencing other, less formal types of relationships within the value chain. Expansion intentions of wineries increase these interactions, as well as have a focus on higher-priced grape varieties.

Key words: wine, contracts, integration, outsourcing, supply-chain

A considerable share of the U.S.-based wine grape and table wine production has been concentrated in California for many years. California has seen steady expansion of wine output over the past few decades, but there is an interesting story on the demand side as well. The Wine Institute noted that the United States surpassed France in 2010 as the largest wine-consuming nation in the world at 330 million cases with 61% coming from California (The Wine Institute, 2011). The interest in wine among U.S. consumers has led to a surge in wineries around the country. Growth in grape and wine production has been rapid, particularly in the Mid-South and Mid-Atlantic States. U.S. Department of Agriculture statistics from 12 states in the region reported a total of 190 wineries in 2003. By 2011, this number was up to 944 (Woods and Ernst, 2011).[1]

Industries facing rapid growth typically face supply-chain coordination challenges (Brown and Eisenhardt, 1998). Wine production, in particular, has a unique value chain

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[1] Some debate exists in how to count the number of wineries. Some wineries use primarily fruit rather than grape wine; others have multiple production facilities. Catchwine.com (2011) reported the 944 number in the 12 state region of Kentucky, Tennessee, Arkansas, Missouri, Illinois, Ohio, Virginia, West Virginia, Pennsylvania, Maryland, North Carolina and Indiana. The WineVineData number of 696 was reported in the Woods and Ernst article in 2011.

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characterized by specific assets (e.g., grape varieties, wine makers, tourism linkages) and perennial crop production that requires grape growers to forecast variety demand in a rapidly changing market. Wineries use a variety of supply chain management tools, including grower contracts, to manage risks associated with supply and quality. Supply chain management strategies for grapes and wine have been studied in California, primarily from the perspective of the growers (Goodhue, Heien, and Lee, 1999; Goodhue, et al., 2003; and Heien, 2006), but this is quite a different market environment characterized by very large-scale vineyards and wineries, long-standing markets, availability of crush price reports, organized trade associations, and experienced growers.[2]

A case study of the business operations and integration strategies of the Mondavi winery illustrates the complexity of integration possibilities facing larger scale wineries. In this account, there is substantial leasing of vineyards, domestic and international joint ventures, long-term (3- to 7-year) production contracts, in addition to an extensive exchange of information with grower partners. Tim Mondavi is quoted in the study as follows: referring to "the winemaking process" as "growing wine," stressing the importance of the relationship between the way grapes were grown and how they were subsequently turned into wine."[3] (Bond, 2000, p.3). The case is indicative of the potential complexity of winery and vineyard relationships that can evolve over time and with increased scale, especially when dealing with specific assets such as unique grape varieties that potentially create competitive advantages over other wineries.

An earlier survey of the Mid-South and Mid-Atlantic States[4] indicated expectations of increased wine production and capacity existed among wineries at that time (Woods, 2006). Wineries in this region have tended to be relatively small, emphasized on-premise retailing, grew less than 15 acres of their own grapes, and, in 2006, only sourced 28% of their grapes through some kind of contract. The majority of grapes utilized by both small (62.2%) and larger (54.6%) wineries were being produced in-house. Expansion of production among existing wineries in the region, together with the emergence of many

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2 The 2007 Economic Census reported 971 wineries in California with $10.76 billion in sales, over $11 million each (Bureau of Labor Statistics). The Wine Institute reports steady growth in the number of bonded California wineries, peaking at 3,364 in 2010 with 241.8 million cases sold, and an average of over 71,000 cases per winery (The Wine Institute). The average case output for wineries in the Mid-South and Mid-Atlantic survey sample was 4,330 cases.

3 See case text p. 3 in Bond 2000.

4 States surveyed in this region during 2011 included Illinois, Indiana, Kentucky, Missouri, Ohio, Tennessee, and Virginia. This was identical to the region surveyed by Woods and Ernst in 2006.

new wineries during recent years, has impacted the way winery owners view local grape supplies.

Few of these wineries are competing at the same scale as the larger California vintners. But the nature of how these wineries relate to their grape grower suppliers in this region can be expected to get more complex as the wineries grow larger, grape supplies become tighter, and more wineries enter the market also looking for grapes.

Survey Methods

A follow-up survey of wineries in the Mid-South and Mid-Atlantic United States was conducted—similar to an earlier one conducted by Woods in 2006—exploring winery relationships with growers and integration strategies. The intent of this study was to compare changes in grower relationships and sourcing strategies in the region and to try to better understand the forces shaping these supply chains.

A mail survey was distributed to 590 winery owners in the seven-state area during the fall and winter of 2010-11 using databases provided by state trade associations and departments of agriculture. A total of 185 usable surveys were returned. The survey gathered some basic data about the winery operation, grape procurement sources and strategies, expansion intensions, degree of vertical integration with grape production, utilization by variety, prices paid and market outlook for various grape varieties, use of various business strategies relating to growers, and marketing approaches.[5]

Winery operation data included information on the age and size of the winery. Procurement strategies included information related to local sourcing (within the same state), percent grown within the winery operation, percent contracted outside the winery, and percent purchased on the spot market by variety used for wine making. Expansion intensions examined plans to expand wine-making capacity and also new capital improvements. Grape sourcing and average prices paid to growers were described by the major varieties within the primary American, French hybrid, and Vinifera grape varieties common to the region. An assortment of potential winery-to-grower business interactions were examined, and the wineries were then asked to indicate the frequency with which these activities took place. Similarly, a variety of marketing approaches were examined.

Observations on Winery Integration

Integration can be observed within the context of the winery business in a number of ways. Backward integration is pursued generally to secure the desired quality and volume

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5 A copy of the survey instrument is available on request from the authors.

of grapes. This can be pursued several different ways. The traditional "make versus buy" continuum would look at full integration for wineries as growing all their grapes opposed to buying them on the spot market. Contracting is a mid-level form of integration that binds winery and vineyard grower to quality and quantity commitments. Goodhue, Heien, and Lee (1999) and Goodhue et al. (2003) noted a wide range of contracts utilized in California vineyards, including oral and written, which also vary in terms and length. The data gathered in our study did not permit us to delve into details regarding contract terms, but wineries did indicate the proportion of each variety used that came from their own vineyard, and whether it was purchased through a contract or on the spot market.

Wineries can build stronger ties with their grape suppliers in other ways. Wineries can have an incentive to share market information or expertise with key suppliers, work with them on site selection and variety choices, and even provide capital or equipment. This can be viewed as a degree of integration. Closer partnerships will be developed in value chains where specific assets are mutually created, search costs are lowered, and longer-term supply and market risks are mitigated in absence of any written contract (Stigler, 1968; and Vukina and Leegomonchai, 2006). Table 1 summarizes the extent to which wineries are engaged in various activities with their grower-suppliers. The degree of engagement correlated highly with the difficulty and extent of commitment required for each. Very few wineries engaged producers by providing financial assistance (e.g., operating loans, financing long-term capital improvements), although there was a higher incidence of communications over variety selection.

Wineries in this eastern region use a wide variety of grapes. Grapes range in availability and cost with American varieties typically being less expensive to grow or source, while French hybrid and, even more so, Vinifera varieties are more expensive. Table 2 shows the grape use by variety. Total use in the region appears fairly evenly divided among three main variety types. Fruit wines and specialty varieties make up the small remaining balance of production.

Integration and variety choice relates to the notion of specific assets. Higher-quality grapes, especially those with unique characteristics, are difficult to grow and buy on the open market. Wineries would presumably have greater incentive to work closely with growers that could supply higher quality grapes through closer working relationships or contracts. Goodhue, Heien, and Lee (1999) noted that California growers tended to contract lower- and medium-priced grapes and to search opportunities in the spot market for the rarer, higher quality grapes. Bolton and Dewatripont (2005) discuss the problem of hold-ups between supply-chain trading partners, noting that where there are specific

Table 1. Winery Relationships with Growers, 2011

Business Function	Never (%)	Sometimes (%)	Often (%)
Internet or e-mail exchange	9.2	41.5	49.3
Share viticultural expertise	10.3	40.7	49.0
Share retail demand information	19.6	47.1	33.3
Formal discussions about wine industry trends	16.5	56.1	27.3
Assist with varietal selection	34.5	42.4	23.0
Assist with site selection	53.3	34.8	11.9
Assist with financing long-term capital improvements	91.7	6.8	1.5
Assist with operating loans	94.0	4.5	1.5
Winery and Grower Business Interactions 2006[a]			
Business Function	Not Practical[b] (%)	Sometimes (%)	Often (%)
Share viticulture expertise	21.1	31.0	47.9
Assist with varietal selection	37.1	31.4	31.4
Internet or e-mail exchange	25.7	47.1	27.1
Formal discussions about wine industry trends	34.3	42.9	22.9
Share retail demand information	42.3	34.8	21.7
Assist with site selection	54.9	33.8	11.3
Assist with operating loans	90.1	5.6	4.2
Assist with financing long-term capital improvements	91.4	5.7	2.9

assets (such as unique or high quality grapes) and long-term incomplete contracts firms push toward integration. The winery presumably would be less likely to face a hold-up situation with lower-priced American variety grapes that could be readily purchased on the open market, keeping wine making and grape production focused in different firms. Table 3, however, shows only slight differences across wineries sourcing by variety. There appears to be a significant shift towards outsourcing across all varieties when weighting the results by winery size, particularly considering the use of the spot market.

Table 2. Grape Use for Wine Making by Variety[a]

Grape Variety	Average Use by Volume (%)	Average Use by Volume, Weighted by Size of Winery (%)
American	20.0	30.1
French Hybrid	37.5	38.7
Vinifera	37.5	26.5
Other	3.9	3.2

[a]Percentages are based on direct reports from wineries without correction for rounding error or a few wineries not reporting sums across varieties equal to 100.

We also examined tendency to outsource by age of the winery. Wineries can follow many paths to become mature-going concerns. Some have started as a vineyard and forward integrated into wine production. Newer wineries are generally associated, however, with newer plantings, if they have them available at all. We would expect them to depend more on outside grape sources during their first five years. Outsourcing did indeed seem to be more common among newer wineries in the survey, particularly the frequency of spot-market purchases. The relationship between winery age and grape sourcing strategy is summarized in Table 4.

Table 3. Dominant Grape Varietal and Outsourcing Strategies

Dominant Variety [a]	N	Own vineyard (%)	Contract (%)	Spot market (%)
American	25	59.4	26.6	13.6
French Hybrid	69	56.2	33.4	10.6
Vinifera	86	59.3	31.3	9.2
Weighted by Size of Winery				
Dominant Variety	N[b]	Own vineyard (%)	Contract (%)	Spot market (%)
American	25	30.0	53.7	16.2
French Hybrid	64	37.1	51.2	11.6
Vinifera	79	33.7	54.3	12.3

[a] Vineyards are categorized by the varietal category representing the largest share of their production.
[b] Not all wineries reported volume of production.

Table 4. Grape Sourcing by Age of Winery

Age Category	N	Own vineyard (%)	Contract (%)	Spot market (%)
0-5 years	25	53.7	29.7	16.6
6-10 years	69	62.9	29.3	7.4
10 years +	86	59.4	35.3	5.3
Weighted by Size of Winery				
Age Category	N	Own vineyard (%)	Contract (%)	Spot market (%)
0-5 years	25	33.7	35.3	30.9
6-10 years	64	35.1	56.4	8.4
10 years +	79	33.5	56	10.7

Integration Index Regression - Determinants of Business Function Use

In addition to examining the "make vs. buy" decision, we looked at the winery-grower relationship for wineries that used external sources for some or all of their winegrapes. Previous studies (Goodhue et al., 2003) have focused on formal aspects of this relationship, including whether a contract was used to procure grapes rather than purchase them on the spot market, and whether various types of provisions were included in those contracts. Our survey included questions about less-formal elements of the relationship. We asked wineries to what degree they engaged in the eight activities identified in Table 1 to facilitate their suppliers' grape production and coordinate it with the wineries' particular needs.

The prospective supply-chain activities investigated were sharing retail demand information and viticultural expertise; assisting with operation loans, financing of capital improvements, varietal selection, and site selection; exchanging information via the Internet or e-mail; and formally discussing wine industry trends. These activities were drawn from the 2006 survey by Woods which were based on interviews with Kentucky winery owners. Each activity was rated as occurring never, sometimes, or often, and we constructed an index that combined these responses with weights of 0, 1, and 2, respectively. The resulting index (0-16 scale) attempts to measure the degree of vertical integration between winery and grower in ways that go beyond formal contracting. Hypotheses related to the potential determinants for this index, along with their descriptive statistics, are presented in Table 5.

Table 5. Determinant Variables for Winery Integration

Variable	Mean	Standard Error	Expected Sign
Dependent Variable – Weighted sum of winery-grower interaction responses			
Integration Index	6.608	3.127	
Winery Age – dummy variable (0/1) assigned according to winery age			
Age 0-5	0.406	0.492	+
Age 6-10	0.198	0.399	-
Age 11	0.396	0.49	-
Growth			
Current Volume (cases)	4330	9578	+
Planned Capacity			
Expansion[a]	1.06	0.98	+
Market Focus			
Wholesale[b]	1.31	0.7	+
Winegrape Focus			
American (%)	20	23.8	-
French Hybrid (%)	37.5	27.9	+
Vinifera (%)	37.5	36.4	+
Other (%)	3.9	12.4	?

[a] Wineries indicated a response to "Expand your winemaking capacity in 2011?" of "no" = 0, "yes <5%" = 1, or "yes >5%" = 2.

[b] Wineries indicated a response to "What marketing approaches do you use for your wine?" of "never" = 0, "sometimes" = 1, or "often" = 2.

The key determinants of integration between wineries and vineyards we explored were related to winery age, growth, market focus, and winegrape focus. We expected integration to change as the winery developed. Again, most of the wineries in this region are very new—over 40% have been in operation for less than 5 years. We expected the younger wineries to more aggressively engage grape suppliers because the option to source from their own vineyard would be limited initially. Older wineries would seem to have more opportunity to grow their own grapes, although they may also be inclined to specialize in a few varieties with which they have experience or otherwise a particular comparative advantage, and outsource those they have learned they cannot grow. It is difficult to form a definitive hypothesis since older wineries may also have experience and advantages in production that would allow them to assist with a wider range of supply-chain activities.

Winery size and planned capacity expansion were expected to positively influence integration. Growers in this region have experienced some difficulty sourcing the grapes they need from local supplies and have increasingly looked to out-of-state suppliers (Woods and Ernst, 2011). As wineries are expanding, they become more vulnerable to hold-up while risking more capital.

Market focus can influence the need to more actively outsource, particularly when growers develop wholesale distribution agreements and commitments to deliver wine. More wineries that compete for wholesale and a supermarket presence will lead to a crowded competitive space. Wineries cannot easily move in and out of wholesaler or other volume buyer relationships without losing competitive traction. Brand proliferation is a significant issue with wine (Tinney, 2006), suggesting wineries themselves face a market-power problem, giving them an incentive to secure regular supplies from their grower partners. The survey examined eight potential market strategies that wineries typically use. Most of these strategies (seven) related to direct sales, although they were also asked to indicate if wholesaling was among the marketing approaches they used. Wineries were provided an opportunity to indicate for each marketing strategy whether it was used "never", "sometimes," or "often." Of the 167 wineries reporting on the use of the wholesale market channel, 22 indicated "never," 72 indicated "sometimes," and 73 indicated "often." The independent variable was constructed as "never" = 0, "sometimes" = 1, and "often" =2.

Grape varieties vary significantly in cost and difficulty to grow in this region (Woods and Ernst, 2011). American varieties are the easiest to source and lowest in price, while French hybrid and, even more so, Vinifera varieties are more expensive. We expected wineries focusing on higher value grapes to be more engaged with growers to plan long term for the right supply. The production and availability of Vinifera varieties particularly requires careful planning and coordination.

We conducted an ordinary least squares regression to investigate the determinants of this informal integration measure. The results are reported in Table 6. The sample was restricted to those respondents who reported using at least one external supplier of winegrapes.

Table 6. OLS Analysis of the Determinants of the Winery Integration Index

Variable	Parameter Estimate
Constant	4.799***
	(1.165)
Age 0-5	0.89
	(0.783)
Age 6-10	-0.455
	(0.751)
Volume	0.0000384
	(0.0000272)
Expansion	0.574*
	(0.332)
Wholesale	0.498
	(0.463)
American	-0.0163*
	(0.0087)
French Hybrid	0.0251**
	(0.0111)
Vinifera	0.0119
	(0.0097)
R^2	0.13
Adjusted R^2	0.06
Root MSE	3.09
F-test (8, 107)	1.99
Prob > F	0.054
AIC	599.41
N	116

*, **, *** indicate statistical significance at the 90%, 95%, and 99% confidence level.

Discussion of Results

A few significant changes among wineries were observed in the region between 2006 and 2011. The most significant was the growth in the number of operations, reflecting a national trend. The survey conducted in 2010-11 collected quite similar information on supply-chain behavior, sourcing, and business demographics. Wineries have not changed very much in average size, actually reporting slightly larger average case sizes in the current survey (4,330 vs. 4,065), yet still much smaller than those in California.

The supply-chain business activity between wineries and vineyards changed a little bit toward more integration. A comparison of these interactions during this period is noted in Table 1. The most significant change came with Internet or e-mail exchange and the various business functions related to information exchange. There appeared to be more effort to assist with varietal selection as well. Actual business integration related to capitalization issues seemed to have changed little.

The integration index determinants were examined in a regression. The size of the operation appeared to affect the degree of integration, with larger operations showing more integration. The coefficient on planned expansion of winemaking capacity was both positive and significant (at the 10% level). Although not statistically significant at the usual thresholds, the estimated coefficient on production volume was also positive. This effect could reflect the greater informational and financial resources that a larger operation might have for sharing with its suppliers. It might also reflect a correlation between vertical integration and more successful, hence, larger and growing operations.

The grape varietals used in production were also connected to integration. The coefficient for production using American hybrids, typically the least expensive grapes and resulting wines, was negative, relative to the omitted "other" category. The coefficient for the more expensive French hybrids was positive. For the Vinifera grapes, the most expensive group of varietals, the coefficient was positive, although not significant. These results are generally consistent with the intuition that wineries would seek to exert more control over the inputs for more valuable wines. Influencing production decisions is especially important when elements of product quality are difficult to measure, and, therefore, less amenable to traditional output-based incentives. Goodhue et al. (2003) report that observable characteristics such as sugar content—referred to as Brix—are more important for lower-quality grapes, whereas other, less easily defined aspects are important for premium grapes. Our results indicate that informal integration may be used as a complement to formal contractual incentives for ensuring quality.

This constructed index suffers from several limitations. It employs equal weights for all integration activities when some, arguably, should carry more importance than others.

For example, providing financial assistance to a supplier would likely indicate a tighter integration of operations compared to providing information by e-mail or a website. In addition, a more sophisticated analytical method, such as a two-stage hurdle model addressing both the "make vs buy" decision and the degree of integration, would likely improve the quality of the results. However, we believe that this analysis, although preliminary, sheds light on interesting aspects of the supplier relationship that have not been closely examined in previous work.

The rapid growth in wineries in the Mid-South and Mid-Atlantic States appears to be a demand-driven phenomenon. The structure of the industry continues to be characterized by many small wineries. The pressure to change the nature of integration within the value chain, however, seems to be increasing as existing wineries expand and new players enter the market. There is an important collection of integration-oriented strategies these wineries can pursue beyond contracting that could help ensure long-term supplies aside from growing the grapes in-house. Value chains in this region are relatively new. Standard operating procedures, including contracting, are still being formed, and in a high velocity environment. The structure and conduct of the wine industry within this region will evolve and be shaped by a whole range of market factors and buyer-supplier partnerships.

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