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Sustainability in the Wine Industry: Altering the Competitive Landscape?

Thomas Atkin
Sonoma State University, USA
Tom.atkin@sonoma.edu

Armand Gilinsky, Jr.
Sonoma State University, USA
Armand.gilinsky@sonoma.edu

Sandra K. Newton
Sonoma State University, USA
newtonsa@sonoma.edu

Abstract

Purpose *– The purpose of this study is to investigate and compare the perceptions of competitive advantage (cost leadership, differentiation, and performance) of those wineries who have implemented a clear business case for EMS and those who have not. Benefits and challenges of sustainability practices are also addressed.*

Design/methodology/approach *– Data were collected via self-report web-based survey. Of the 98 respondents, over 80% were family-owned, family-managed.*

Findings *– Those respondents with a clear business case for EMS exhibited significant differences in cost leadership and differentiation advantages over those without a clear business case for EMS.*

Originality/value *– Activities that create competitive advantages for wine businesses are understudied; this research bridges that gap.*

Practical implications *- Those with a clear EMS derived significantly greater supply chain optimization and operational efficiencies than those without a clear EMS. Those with a clear EMS also felt that they gained an enhanced ability to enter new markets to a much greater extent than those without a clear EMS. Results of this study demonstrate a significantly higher level of*

commitment by those respondents with a clear EMS when addressing sustainability initiatives during an current economic down turn, over those who did not. Those respondents who had a clear EMS indicated that they had somewhat increased their sustainability commitments, rather than conducting business as usual with no change or somewhat decreasing sustainability commitments as those who did not have a clear EMS.

Key words: *Environmental Management System (EMS), cost leadership, differentiation, competitive advantage, family-owned, family-managed.*

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What managers need is a basis from which they can prioritize environmental investments. More broadly, they need to align these investments with the generic strategy of the company. — Renato J. Orsato

There is determinism going on in the world, but at a very complex level, so complex that we as researchers do not understand it all. — Frank J. Sulloway

1. SUSTAINABILITY AND COMPETITIVE ADVANTAGE

Managing environmental issues is a critical element of strategic planning and a driver of competitive advantage, but an environmental management system (henceforth, EMS) requires more than doing well (York and Venkataraman, 2010). Strategy requires managers to identify the areas in which their businesses can focus environmental efforts in the pursuit of competitive advantage (Orsato, 2006). Although the wine industry has survived numerous environmental jolts (Stoeberl et al., 1998; Swaminathan, 1995; Taplin, 2006), wine businesses confront survival threats from the natural world e.g. rising energy prices, water scarcity, mounting concerns about chemical exposure, and climate change (Guthey and Whiteman, 2009; Hertsgaard, 2010). Mitigating these threats involves many different actors and institutions in the wine business manager's decision to formalize the business case for EMS (Guthey and Whiteman, 2009); stakeholder pressures drive adoption of EMS (Cordano et al., 2010; Fotopoulos et al., 2003; Marshall et al., 2010). Adoption of EMS can result in product innovation, pollution prevention, and stewardship of natural resources (Berns et al., 2009; Carrillo-Hemosilla et al., 2010; Hughey et al., 2005). As the scope and intractability of an environmental problem rise, so do opportunities for EMS innovation in the pursuit of competitive advantage (Matzler et al., 2010; Porter and Van Der Linde, 1995; York and Venkataraman, 2010).

Financial incentives that encourage EMS process and product innovations may be positively related to business performance (Nguyen and Slater, 2010; York and Venkataraman, 2010). Some researchers have found that business age, size, and ownership (public v. private) are related to investments in EMS (Elsayed, 2006; Melnyk et al., 2003; York and Venkataraman, 2010). Because of the huge sunk cost associated with EMS investments, incumbent businesses may resist adoption due to fears of cannibalizing existing product lines and instead elect to pursue only those activities considered absolutely necessary for regulatory compliance (Gabzydlova et al., 2009; Hughey et al., 2005; Manktelow et al., 2002; Silverman et al, 2005). Younger, entrepreneurial agricultural businesses, conversely, show a propensity to invest in EMS innovations that supplant existing structures, some creating new standards for sustainable processes and products (Carrillo-Hermosilla et al., 2010; Gilinsky et al., 2008).

1.1. Importance of this research

Activities that create competitive advantages for wine businesses are understudied (Delmas and Grant, 2008; Fearne, 2009). Wine is a *big* business: grape growing and wine making and related support activities impact other high value-added agricultural sectors in particular and the ecosystem of a region of origin in general (Cholette and Venkat, 2009; Remaud et al., 2008; Warner, 2007; Zucca et al., 2009). Just prior to the prolonged recession that negatively impacted

all sectors in 2009 and 2010, the wine industry produced almost $59 billion in economic value for California and more than $120 billion in revenue for the entire U.S. (Stonebridge Research, 2008). Nearly 40 percent of the impact of California's wine industry on the U.S. economy in 2008 — about $41.9 billion — was attributed to the Napa Valley, which produced 4 percent of the wine grown in California (Stonebridge Research, 2008). With that much money at stake, it is surprising that there have been relatively few studies identifying drivers of competitive advantage in the wine industry (Delacroix and Swaminathan, 1991; Swaminathan, 1995; Taplin, 2006; Jordan et al., 2007). Moreover, no empirical studies have been conducted regarding the impact of sustainability in the wine industry on competitive advantage.

1.2. Research questions and organization of this paper

Extant research into wine businesses and sustainability has focused on the factors leading to adoption of EMS (Fearne, 2009; Gabzdylova et al., 2009; Hughey et al., 2005; Marshall et al., 2010; Silverman et al., 2005; Warner, 2007). Others have examined eco-labeling or eco-branding product differentiation strategies to ascertain if those attributes enable a wine brand to stand out in a crowded fight for "mouth share" (Brugarolas et al., 2005; Forbes et al., 2009; Fotopoulos et al., 2003; Remaud et al., 2008). Wine business research needs to confirm linkages between EMS and performance, a proxy for competitive advantage (Bernabeu et al., 2008; Melnyk et al., 2003; Orsato, 2006; Waddock and Graves, 1997 Harrison et al., 2010). What are the most important aspects of an EMS for a wine business? Does it make a difference if a wine business has established a clear business case for EMS (rather than, say, pursuing an ill-defined or informal package of pollution mitigation activities)? What are sustainable wine businesses doing differently than those that are considering — or have no intention of — investment in and implementation of sustainable business practices? This study addresses three basic questions (Sharma and Aragon-Correa, 2005):

1. How does the presence or absence of a business model that incorporates EMS impact wine business performance?
2. Does a wine business perceive competitive advantages such as cost leadership or differentiation from implementing a formal EMS?
3. What is the impact on performance of a wine business model that incorporates EMS?

This paper is organized into five sections. The next section summarizes prior research into the connections among EMS, generic strategies, and performance, leading to hypotheses tested in this study. The third section describes survey design and statistical methodology. The fourth section presents findings and a discussion of results. We close with a discussion of the implications for future researchers as well as wine industry practitioners considering sustainable business activities to attain competitive advantage.

2. RELEVANT RESEARCH ORIENTATIONS

Managers of wine businesses need to justify investments in environmental strategies. Some industry observers consider all but the ultra-premium and luxury segments of the wine industry to be mature and saturated (Steinthal and Hinman, 2007). Where should managers place their bets, given resource scarcity, and what outcomes might be realized? How should managers go

about prioritizing investments in waste reduction, water use minimization, organics, biodynamic farming, energy efficiency and self-sufficiency, eco-labeling, eco-branding, eco-friendly packaging, etc.? A sustainable strategic position, according to Porter (1980), requires managers to choose between trade-offs. The need for parsimony precludes a longer exposition, however, building on the work of Porter (1980, 1985) and Barney (1997), researchers have sought to prove linkages between EMS, generic strategies of cost leadership and differentiation, and competitive advantage. See Table 1, "Summary of Prior Research into EMS and Generic Strategy."

Table 1. Summary of Prior Research into EMS and Generic Strategy.

GENERIC STRATEGY AND EMS	AUTHOR(S)
Cost leadership **1. Relative price: eco-efficient materials, re-use by-products, high process yields** **2. Relative share: radical process innovations to disrupt mature markets** **3. Barriers to entry: lowest price and lowest impact on environment** **Manifestations of competitive advantage** **Scale economies, learning curve, differential low-cost access, waste minimization, technological innovation, structure, employee retention and compensation**	**Porter (1991)** **Barney (1997)** **Sroufe (2000)** **Orsato (2006)**
Differentiation **1. Consumer perception: clear benefit or environmental value** **2. Product/service uniqueness: difficulty of replication or imitation by rivals** **3. Consumer confidence: reputation, loyalty/retention, life cycle value** **Manifestations of competitive advantage** **Product features such as organic or biodynamic, clear linkages between environmental management and business functions, early entry timing, location, product mix, inter-firm linkages, improved service, image**	**Wood (1991)** **Porter & Van der Linde (1995)** **Barney (1997)** **Waddock et al. (2002)** **Reinhardt (1998)** **Orsato (2006)**

Source: prepared by authors for use in this investigation.

Several studies have been those focused on EMS as a means of achieving economies of scale and scope in mature, saturated markets, i.e., those in which undifferentiated products compete primarily on price (Orsato, 2006; Sroufe, 2000). Others have focused on examining the relationship between EMS and differentiation, i.e., via eco-branding and going beyond mere compliance, a business seeks and defends a niche in which it can extract a price premium in return for higher consumer perceived value (based on increasing consumer awareness of and need for environmentally-friendly products and services), unique attributes or features that are difficult or costly for rivals to imitate (e.g. external certifications such as Demeter, LEED, CERES or ISO 14001), and/or improved consumer confidence and trust (Reinhardt, 1998; Wood, 1991; Waddock et al., 2002;). This leads to the following three hypotheses:

H1: Wineries that have justified a business case for EMS are more likely to have a perceived *cost advantage.*

H2: Wineries that have justified a business case for EMS are more likely to have a perceived *differentiation advantage.*

H3: Wineries that have justified a business case for EMS are more likely to *demonstrate superior operating performance* over rivals.

3. RESEARCH DESIGN

The survey instrument to collect information on winery sustainability practices, e.g., sustainability defined, potential impacts, strategies, possible challenges and benefits, and the value in sustainability, was adapted from the survey instrument used by Berns, et al. (2009). Relevant questions for this study are shown in the Appendix. Prior to the main study, a student researcher pilot-tested the survey with owners of twelve wineries in Northern California for suitability of questions and appropriate questionnaire length.

Research was conducted by web-based survey. A subsequent pilot sample of 16 Green Wine Summit attendees was collected to further test the suitability of the questions via the web-based survey. Using a modified Dillman (1978) method, two waves of mailings were sent to a random sample of US wineries in a database compiled from attendees at the annual Unified Wine and Grape Symposium in Sacramento, California. The initial email was sent to 1469 usable email addresses. Follow-up emails were sent two weeks later. Ninety-eight usable, completed surveys were received, resulting in a response rate of 7%, which is not atypical of mail surveys. Non-response bias data were not collected for those respondents who started, but chose not to complete the questionnaire by closing their browser. Thus, we could not assess how those who completed the survey compared to those who did not. Some non-response was deemed to be due to the timing of the survey, which coincided with the Fall 2010 grape harvest cycle.

Company owners comprised sixty-eight percent of the respondents; respondents were asked to check all that apply as to their relationship to their winery (see Table 2). Over 80% of respondents' wineries were family-owned, family-managed. The majority of the wineries were small and medium case producers; more than three-quarters of respondents' wineries produced less than 20,000 cases. Demographics of the wineries are detailed in Table 3.

Table 2. Respondents *(checked all that apply)*

	Response %
Owner of my company	68.0%
Winemaker	43.3%
CEO of my company	18.6%
Other	11.3%
Division manager	10.3%
Consultant	3.1%

Table 3. Respondent's Winery Demographics (N=98)

Age of Winery		Production		Five-year growth rates, 2005-2010		
Years		Cases		Growth %	Case sales	Profits
100+	3.0%	<2,000	39.2%	>20%	28.4%	12.5%
50–99	7.1%	2,001-20,000	38.1%	11%–20%	17.9%	14.6%
11–49	44.4%	20,001–50,000	7.2%	5%–10%	22.1%	19.8%
5–10	30.3%	50,001–100,000	3.1%	1%–4%	15.8%	16.7%
<5	15.2%	>100,000	12.4%	0% or negative	15.8%	36.5%
TOTAL	100%		100%		100%	100%

4. DISCUSSION OF RESULTS

4.1. The case for EMS: sustainability defined

To examine differences in performance, as well as cost leadership and differentiation advantage indicators, respondents were asked, "Has your organization developed a clear business case or proven "value proposition" for addressing sustainability?" Twenty-two percent (or a fifth of the sample) indicated a clear case for EMS, 57% indicated no clear case, 16% were unsure, and 6% indicated that, "they had tried adopting EMS but it was too difficult to develop and continue." The sample is roughly representative of the portion of interested wineries that have set up formal systems according to the Wine Institute. They report that of the 3,400 bonded wineries in California, 230 have participated in the self-assessment of their sustainable practices. Thirty-eight, or 16.5%, of that group have instituted formal programs and achieved certification from the Wine Institute.[1] For the purpose of this study, the 21 respondents indicating "a clear business case for EMS" were included in the "Clear EMS" group; the remaining 77 were included in the "No Clear EMS" group. When asked about their business commitment to sustainability, 48% of the respondents indicated their wineries were "sustainable from the start"; 28% had "recently adopted" sustainable practices, 13% "planned to adopt" sustainable practices, but were "not yet ready"; 8% never adopted sustainable practices, "but might be interested"; and 3% indicated "no interest" in adopting sustainable practices.

Early questions in the survey asked respondents to define sustainability and the extent to which that term applied to their organizations. Using a Likert scale [Strongly Disagree (1) to Strongly Agree (5)], respondents rated varied definitions of sustainability. While there were no statistical significant differences between the two groups, "Clear EMS" and "No Clear EMS," the sustainability statements and group means are at Table 4.

Table 4. Sustainability Defined

Sustainability Definition Statements	Clear EMS	No Clear EMS
Sustainability refers to other environmental issues	4.24	4.03
Sustainability refers to meeting the needs of the current generation without compromising the ability of future generations to meet their needs	4.22	4.06
Sustainability refers to addressing issues from a long-term perspective	4.18	4.20
Sustainability refers to maintaining the viability of our business	4.18	3.89
Sustainability refers to corporate social responsibility issues	4.18	3.72
Sustainability incorporates climate change, environmental, social, and economic issues	4.18	3.70
Sustainability refers to climate change issues	3.65	3.20

4.2. EMS and generic strategy

Content validity of the measurement instrument was established mainly through the adoption of existing instruments. Statements indicating cost leadership advantage and differentiation advantage were used in the analyses and found acceptable with Cronbach alpha scores of .89 and .78 respectively (Nunnally and Bernstein, 1994). Standard and multivariate assumptions were tested and found adequate to perform the analyses. While the sample size for this study is small

[1] Conversation with Alison Jordan, Environmental Affairs, The Wine Institute, April 20, 2011.

(N=98); the recommended minimum cell size of 20 observations for the multivariate analyses was met (Hair, Anderson, Tatham, and Black, 1998).

To assess the cost advantage indicators simultaneously in the model, multivariate analysis of variance (MANOVA) was used. The cost advantage indicators were entered as the dependent variables, and the codes for those with a clear business case for EMS versus those without were entered as the independent variable. All four of the omnibus MANOVA test statistics were significant at $\alpha = .05$ cutoff with F Statistic = 2.347, Sig. = .023 with an observed power of .887, offering support for Hypothesis 1. Supply chain optimization, lower legal and regulatory risk, and greater operational efficiency cost advantage indicators were the significant indicators as shown in the univariate test results in Table 5. The means of the 21 respondents with a clear business case for EMS versus the 77 respondents without a clear business case for EMS are also shown for each cost advantage indicator in order of the cost advantage indicator significance.

Table 5. Cost Advantage Indicator Univariate Test Results – Hypothesis 1

All Cost Advantage Indicators Analyzed	Clear EMS Mean	No Clear EMS Mean	F	Sig.
Supply chain optimization	4.29	3.20	15.474	.000*
Lower legal and regulatory risk	4.07	3.31	7.111	.010*
Greater operational efficiency	4.14	3.51	5.011	.029*
More potential sources of revenue	3.93	3.27	3.852	.054
Lower cost of capital	3.57	2.94	3.593	.063
Greater access to capital, financing and insurance	3.62	2.92	3.429	.069
Employee recruitment, morale, retention	3.43	2.77	2.804	.099
Lower financial and operating risk	3.86	3.29	2.753	.102
Lower costs and taxes	3.86	3.59	.955	.167
More efficient use of resources	4.31	4.04	.697	.407

*Statistically significant at alpha ≤.05.

For Hypothesis 2, the differentiation advantage indicators were entered as the dependent variables in the model. Codes for those with a clear business case for EMS versus those without were entered as the independent variable. All four of the omnibus MANOVA test statistics were significant at $\alpha = .05$ cutoff with an F-Statistic = 2.772 and Sig. = .035 with an observed power of .729, offering support for Hypothesis 2. Enhanced ability to enter new markets was the significant indicator as shown in the univariate test results in Table 6. The means of the 21 respondents with a clear business case for EMS versus the 77 respondents without a clear business case for EMS are also shown for each differentiation advantage indicator in order of significance.

Table 6. Differentiation Advantage Indicator Univariate Test Results – Hypothesis 2

All Differentiation Advantage Indicators Analyzed	Clear EMS Mean	No Clear EMS Mean	F	Sig.
Enhanced ability to enter new markets	4.00	3.15	6.946	.011*
Stronger brand and greater pricing power	4.00	3.58	2.229	.140
Ability to justify and charge a price premium for our products	3.57	3.21	1.304	.258
Improved customer loyalty	3.86	3.87	.001	.977

*Statistically significant at alpha ≤.05.

4.3. EMS and performance

To assess the impact a clear business case for EMS might have on operational performance,

MANOVA was conducted entering winery growth rate in case sales over the past five years and winery growth rate in company profits over the past five years as the dependent variables. Codes for those with a clear business case for EMS versus those without were entered as the independent variable. The four omnibus MANOVA test statistics were generated and none were significant at $\alpha = .05$ cutoff with an F-Statistic = .570 and Sig. = .568, thus Hypothesis 3 was not supported. No significant differences in operational performance in winery growth rate in case sales or company profits over the past five years were found when comparing those wineries with a clear business case for EMS versus those wineries with no case for EMS (see Table 7).

Table 7. Case Sales and Profit Univariate Test Results– Hypothesis 3

	Clear EMS Mean	No Clear EMS Mean	F	Sig.
Case Sales Growth	2.94	2.76	.198	.658
Profits Growth	3.41	3.59	.349	.556

5. IMPLICATIONS FOR RESEARCHERS AND PRACTITIONERS

The literature suggests linkages between EMS and opportunities for competitive advantage (Melnyk et al., 2003; Porter, 1985). This study's found that wineries with a clear business case for EMS reported greater perceptions of cost leadership and differentiation advantages over those that did not have a clear business case for EMS. Wineries incorporated EMS despite the economic downturn.

5.1. Cost leadership advantage

Those with a clear EMS derived greater benefit on key cost leadership advantage indicators: supply chain optimization, lower legal and regulatory risk, and greater efficiency. Other cost leadership indicators, more potential sources of revenue, lower cost of capital, greater access to capital, financing and insurance, and employee recruitment, morale, and retention were also of benefit to those with a clear EMS.

Optimizing the supply chain is recognizably basic for competitive advantage, as the majority of California wineries are vertically integrated, managing their winery operations, and growing their own grapes (Silverman et al., 2005). This issue is also vital for those wineries that frequently exert control over outside grape growers, often ensuring that those growers also reflect similar environmental values. Actively choosing and promoting suppliers providing equipment, packaging and transportation with a focus on sustainable practices is a high leverage area where businesses can influence environmentally friendly practices (Walton et al, 1998). This would also include additional environmentally friendly ways to improve the supply chain including materials used in the product – bottles, labels, closures, etc., as well as new product design; supplier process improvements; supplier evaluation; and inbound logistics.

Those firms possessing a clear business case for EMS reported significantly greater operational efficiencies than those without. Melnyk et al. (2003) found that the impact of environmental activities on corporate performance is strongly affected by the presence of a formal EMS with the largest differences in the reputation of the firm and a sense that benefits exceeded cost. More recently, Lubell et al (2010) also found economic benefits exceeded costs for the majority of

practices measured; benefits stemmed from reduced input costs, improvements to quality, and compliance with environmental regulations.

5.2. Differentiation advantage

Wineries with a clear business case for EMS demonstrated perceptions of greater differentiation advantages over those who did not have a clear business case for EMS, specifically those with a clear EMS felt that they gained an enhanced ability to enter new markets to a much greater extent than those without a clear EMS. Those with a clear case for EMS did not, however, report improved customer loyalty or pricing power. This finding is consistent with prior research that found no sales advantage from organic or sustainable labeling; certifying grapes as "organic" can result in a price premium, but including an eco-label specifying "organic" on the package reduces the price by 20%, due to the negative connotation of organic wine in the marketplace (Delmas and Grant, 2008).

Many consumers are not familiar with the eco-certification process and associate it with a lower quality wine; hence, many wineries choose not to place eco-certification information on their labels. Wine eco-certification is a relatively recent phenomenon and still lacks positive recognition from consumers, often due to concerns that wine without sulfites added can be aged without spoiling (Delmas and Grant, 2008). Atkin and Johnson (2010) found that organic information ranked last among a group of ten types of information that wine consumers utilized to gauge the quality of the wine (i.e. fewer than ten percent of consumers reported using organic information, validating that eco-certification is not well understood by consumers).

Even though those with a clear business case for EMS did not perceive a greater price or loyalty benefit in the marketplace, wineries can obtain a cost advantage from adopting sustainable practices. The sales advantage may not initially come from promoting sustainable practices to retail consumers, but instead at the cellar door and to wine club members where winery staff or website media can relate the sustainability story (Nowak et al., 2010). Wineries can target to the consumer market that is looking for the environmental value (Orth et al., 2005). Among other advantages of EMS are enhancement of company reputation and illustration of best practices that can be shared with industry trade associations (Delmas and Grant, 2008).

5.3. Performance

Respondents with a clear business case for EMS reported a significantly higher level of commitment to address sustainability initiatives during the recent economic downturn, over those who did not have a clear business case for EMS. More important, respondents who had a clear business case for EMS indicated that they had somewhat increased their sustainability commitments. Although prior linkages between EMS and performance have been shown (Waddock and Graves, 1997; Melnyk et al., 2003), using case sales growth and profit growth as our proxy for performance, no clear evidence emerged to support an assertion that those wineries with a clear business case for EMS would be more likely to demonstrate superior operating performance over rivals.

While this research found no significant evidence that the presence or absence of a clear business

case for EMS impacts performance, important differences were noted. One being that neither subsample identified "market share" as a key or top metric to measure winery performance.

6. CONCLUSIONS AND FUTURE RESEARCH

Prior studies show that environmental values and personal satisfaction drive sustainability investment decisions (Gabzdylova et al., 2009). Silverman and his colleagues (2005) opine that internal issues such as the desire to be good stewards of the land are highly correlated with the successful implementation of environmental policies. The findings from this investigation support those perspectives while acknowledging other mitigating factors, i.e. differing degrees of formality with implementing sustainability, age, and/or size of the winery. While only 21% of the respondents had indicated a "clear business case for EMS," over 75% of them indicated their wineries were either sustainable from the start or had recently adopted sustainable practices.

The U.S. wine industry is characterized by a large number of small and medium size wineries and very few large corporate wineries (Marshall et al, 2010). The majority of the sample is small wineries, with 78% producing fewer than 20,000 cases per year. This is roughly similar to the 2005 study by Silverman and his colleagues, where 64% of the sample produced less than 25,000 cases per year. Earlier research has shown that smaller wineries frequently implement specific components of a formal EMS even if they are not able to support a formal comprehensive EMS (Kolk, 2000). Formal comprehensive programs stemming from an EMS, such as ISO 14001, are often possible only at larger wineries that can afford the cost of implementation, and even then, only a few have actually attained ISO 14001 certification (Thomas et al., 2004).

Regardless of age or size, many wineries are proceeding with sustainable practices, even if no differentiation advantage is manifest. The Lodi Winegrape Commission states that the top motivation for grape growers to participate in sustainable efforts is "to preserve the family's agricultural legacy and to pass that legacy along to future generations" (Hoffman, 2010). Sustainability practices are part and parcel of how cultural capital is passed from one generation to the next. This was as substantiated by one respondent with a clear EMS from this investigation who wrote, "Sustainability has been a commitment since our founding; it's what we do to ensure we can pass along a healthy family business to the next generation." As over 80% of the respondents were family-owned and family-managed, framing sustainability in the context of generational succession may be a rationale for industry opinion leaders as well as trade associations to promote and disseminate best EMS practices. Future investigations are needed to ascertain any longitudinal impacts of framing sustainability in the guise of creating and preserving inter-generational equity.

Caution should be used in generalizing the results, as this study is not without its limitations, e.g., small sample when compared to the population, lack of outside or independent verification as survey design was self-report, and no assumptions of winery age or size within the analyses results. The performance measures used in the study, while adapted from Berns, et al. (2009), are not collectively exhaustive and could be subject to debate.

Yet this study finds that wineries appear highly aware of sustainability issues and recognize the importance to caring for the environment. While many have adopted sustainable practices, the

perceived benefits of going beyond those to the adoption of a formal EMS program are not yet crystal-clear. There is a perception of a cost advantage benefit to a formal program, but not necessarily a sales benefit, with the possible exception of increased ability to enter new markets. More consumer education on sustainability benefits may be necessary to develop a "pull" demand strategy that could result in increased sales. Future investigations are needed to ascertain any longitudinal impacts of building consumer education and awareness as well as impacts on success in new markets.

Likewise, continued progress toward sustainability at the level of the individual business depends largely on increasing the awareness of owners and managers to the benefits to the environment (i.e., values). Managers that have strong environmental values can then infuse these values throughout the company (Marshall et al., 2005). One mechanism to increase such awareness would be the sharing of best practices and their impact on cost and quality. Future investigations are needed to ascertain any longitudinal impacts of sharing best practices on sustainability and cost reduction and/or quality improvement. Future investigations looking into other regions in the US, as well as internationally, might prove fruitful.

The picture that emerges from this research is that today the benefits of an EMS result from gains on the supply side rather than gains in the marketplace. Respondents who had a clear business case for EMS indicated that they had somewhat increased their sustainability commitments despite the economic downturn. In the retail environment, the lack of consumer support underscores the perceptions of wineries that the differentiation benefit from the market promotion of a formal EMS is not yet apparent, but that doesn't negate the positive cost-benefit impacts for those implementing formal EMS.

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Appendix. Abridged Survey

1) Please tell us about your business – growth rate in your company's case sales over the past five years.
   >20% 10% - 20% 5% - 10% 1% - 5% Zero or negative

2) Please tell us about your business – growth rate in your company's profits over the past five years.
   >20% 10% - 20% 5% - 10% 1% - 5% Zero or negative

3) Which of the following statements best defines how your organization defines sustainability? (Please rate on a scale of 1 to 5, where 1 is "No impact" and 5 is "Major impact")

Sustainability refers to climate change issues
Sustainability refers to other environmental issues
Sustainability refers to corporate social responsibility issues
Sustainability refers to maintaining the viability of our business
Sustainability incorporates climate change, environmental, social, and economic issues
Sustainability refers to meeting the needs of the current generation without compromising the ability of future generations to meet their needs
Sustainability refers to addressing issues from a long-term perspective
Other

4) Has your organization developed a clear business case or proven "value proposition" for addressing sustainability? (Please select one)

Yes
No
Unsure
Have tried but too difficult to develop and continue

5) Please tell us about your business – commitment to sustainability. (Please select one)

No interest in adopting sustainable practices
Never adopted sustainable practices but might be interested
Planning to adopt sustainable practices but not ready yet
Recently adopted sustainable practices

6) Please rate the potential impact of the following sustainability practices on your organization: (Please rate on a scale of 1-5, where 1 is "Not important," 3 is "Important," and 5 is "Extremely important.")

Stronger brand and greater pricing power
Employee recruitment, morale, retention
Greater operational efficiency
More efficient use of resources
Supply chain optimization
Lower costs and taxes
Ability to justify and charge a price premium for our products
Improved customer loyalty
More potential sources of revenue
Enhanced ability to enter new markets (e.g. exports)
Lower financial and operating risk
Lower legal and regulatory risk
Lower cost of capital
Greater access to capital, financing and insurance

Other (please state)