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Environmental strategy: does it lead to competitive advantage in the US wine industry?

Thomas Atkin, Armand Gilinsky Jr and Sandra K. Newton
Sonoma State University, Rohnert Park, California, USA

Abstract

Purpose – The purpose of this paper is to investigate and compare the perceptions of competitive advantage (cost leadership, differentiation, and performance) of those wineries which have implemented a clear business case for an environmental management system (EMS) and those which 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 per cent 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. 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 a 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.

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

Keywords United States of America, Wine business, Competitive advantage, Family firms, Environmental management system, Cost leadership, Differentiation, Family-owned, Family-managed, United States of America

Paper type Research paper

> 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.
>
> No existing business completely fits the definition of an ecologically sustainable organization [...] a few visionary businesses, however, have embraced the concept and begun to try to live up to this ideal (Lawrence and Weber, 2011, p. 257).

1. Environmental strategy and competitive advantage

Managing environmental issues is a critical element of strategic planning. Less well known is whether or not managing environmental issues represents a potential or even beneficial entrepreneurial response in pursuit of either a low-cost or a differentiation position, essential to attaining a competitive advantage (Orsato, 2006). An environmental management system (EMS) is more than "doing well" or "greenwashing."

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Implementing an EMS requires significant investments of managerial time, financial capital, and know-how (York and Venkataraman, 2010). While the wine industry has survived numerous environmental jolts in terms of industry evolution, wine businesses also confront survival threats from the natural world such as 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 a business case for EMS. Stakeholder pressures drive adoption of EMS, and adoption of EMS, in turn, can result in product innovation, pollution prevention, and stewardship of natural resources (Berns *et al.*, 2009; Carrillo-Hemosilla *et al.*, 2010). As the scope and intractability of an environmental problem rise, so do opportunities for EMS innovation in the pursuit of competitive advantage (Porter and Van der Linde, 1995).

The EMS process and product innovations may be positively related to business performance (Nguyen and Slater, 2010; York and Venkataraman, 2010). Several researchers have found that business age, size, and ownership (public versus 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 (Gabzdylova *et al.*, 2009; Hughey *et al.*, 2005; Manktelow *et al.*, 2002). 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-Hemosilla *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 with particular salience for selection of supply chains (Cholette and Venkat, 2009; Remaud *et al.*, 2008; Zucca *et al.*, 2009). Just prior to the prolonged recession that negatively impacted all sectors in 2009 and 2010, the wine industry produced more than $120 billion in revenue for the entire USA (Stonebridge Research, 2008). With that much money at stake, it is surprising that there have been relatively few recent studies identifying drivers of competitive advantage in the wine industry (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

Recent 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). 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). For this study, we seek to answer three basic questions:

(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?

Our paper is organized into five sections. The next section summarizes prior research into the connections among EMS, generic strategies, and performance, leading to the hypotheses tested in this study. Section 3 describes the survey design and statistical methodology. Section 4 presents findings and a discussion of results. We close with a discussion of the implications for wine industry practitioners considering sustainable business activities to attain competitive advantage.

2. Relevant research orientations and hypotheses

Optimizing the economic return on investments with environmental strategies is a key consideration of managers of wine business. There is a movement of wine businesses toward sustainable farming and business practices, whether organic, biodynamic, or a combination; and these environmental strategies can work toward a differentiation of their brand at retail (Steinthal and Hinman, 2007).

A sustainable strategic position, according to Porter (1980), requires managers to choose between trade-offs. The conventional wisdom circa 1990 held that investments in improved environmental performance would reduce profits due to increased costs, reduced quality or increased lead time. Porter (1991) started a shift in manufacturer's attitudes towards environmental responsibility in 1991. He maintained that pollution was simply waste that diminished value and indicated problems in production processes and products. Eliminating pollution waste would actually improve competitiveness.

Building on the work of Porter (1980, 1985) and Barney (1997), researchers have sought to prove linkages between the existence of an EMS and the generic strategies of cost leadership and differentiation, and competitive advantage (Table I).

In strategic management, according to the resource-based view (RBV) (Wernerfelt, 1984), distinctive competencies are defined as firm specific strengths that allow a company to gain a competitive advantage over its rivals either through differentiation or lower cost (Hill and Jones, 2010). Distinctive competencies can be classified in terms of resources or capabilities and their value, rareness, inimitability, and organisational sustainability. Resources are assets of the company that can be tangible (physical items such as land, buildings, equipment, inventory and money) or intangible (nonphysical items such as brand name, copyrights, patents and trademarks). Capabilities are skills, processes and routines that companies develop over time to coordinate and use the resources.

Sustainability practices can serve as part of a firm's capabilities that contribute to performance according to the RBV (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984). The RBV starts with the assumption that the desired outcome of managerial effort is the establishment of a sustainable competitive advantage. The basic elements of an effective EMS are described in ISO 14001 standards, and as such, ISO 14001 certification can be thought of as an intangible resource that improves the quality of management in order to provide operational efficiencies (Delmas, 2001).

Generic strategy and EMS	Author(s)
Cost leadership	
1. Relative price: eco-efficient materials, re-use by-products, high process yields	Porter (1991), Barney (1997), Sroufe (2000), Orsato (2006)
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	
Differentiation	
1. Consumer perception: clear benefit or environmental value	Wood (1991), Porter and Van der Linde (1995), Barney (1997), Waddock *et al.* (2002), Reinhardt (1998), Orsato (2006)
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	

Source: Prepared by authors for use in this investigation

Table I.
Summary of prior research into EMS and generic strategy

Prior research into EMS tools, such as ISO 14001, have found that they have the ability to provide economic benefits to certified firms in terms of competitive advantage as well as improving environmental performance (Bansal, 1999; Corbett and Kirsch, 2001). Direct financial benefits might include a reduction in regulatory fines and increased operational efficiencies. Certification can also indicate that the company has a sound environmental system in place to placate external stakeholders such as customers, investors, and regulatory agencies.

An expanded version of RBV theory is the natural RBV that includes a firm's environmental practices (Hart, 1995). Several studies have linked enhanced environmental practices with improved economic, operational, and environmental performance (Melnyk *et al.*, 2003; Rao and Holt, 2005; Sroufe, 2003).

2.1 Cost leadership advantage

Grimstad (2011) posited that the global wine glut leads to a focus on cost reduction and initiatives to achieve competitive advantage of environmentally certified wines. Christmann (2000) surveyed 88 large chemical firms and found evidence that capabilities for process innovation and implementation, central to deployment of EMS, are complementary assets that moderate the relationship between best practices and cost advantage, a significant factor in determining firm performance. Prior to the advent of new technologies (i.e. recycling, energy efficiency and self-sufficiency, Internet),

it was difficult for SMEs to pursue cost advantages. Within the past 15 years companies such as Cirque du Soleil, Trader Joe's, Nintendo (Wii), and [yellowtail]® wine, have introduced high quality differentiated products for lower prices through innovative use of new technologies, whilst sustaining a cost advantage over rivals, which has been termed a "best-cost" strategy. A "best cost" generic strategy is a fairly recent construct in business strategy; some SMEs strive for best cost and value innovation, i.e. broader market penetration and higher returns (Kim and Mauborgne, 2005, p. 27; Gilinsky *et al.*, 2010).

Some research relating to the wine industry has shown mixed results. Researchers in California found that external pressures did not help to explain differences in the level of success wineries and vineyards achieved in implementing environmental practices (Silverman *et al.*, 2005). Yet, for internal pressures such as reduced costs and reputable company image, it was found that highly successful wineries perceived internal pressures to be greater than less successful wineries. That study concluded that the development of an EMS may be more likely to generate beyond-compliance initiatives than new regulations or stronger enforcement. This leads to our first hypothesis:

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

2.2 Differentiation advantage

A differentiation strategy allows a company to create a unique product, where customers perceive it as different or distinct in some way that is important to them and allows the company to charge a premium price for its product or service (Hill and Jones, 2010). Previous results, mostly relating to large firms, suggest that SMEs have difficulty in obtaining competitive advantages through environmental proactivity (Russo and Fouts, 1997; Sharma and Vredenburg, 1998). However, we propose that EMS can generate a set of capabilities that facilitate certain innovations in product development for SMEs. Proactive environmental management can provide SMEs with a competitive advantage through differentiation of their products (if the company products are ecological) and by increasing the firm's reputation as a good corporate citizen. Sustainably-produced products and products that are themselves environmentally munificent may be considered unique and different by the consumers (Porter and Van der Linde, 1995), resulting in above-average returns.

Management researchers have asserted that the costs of improving environmental performance can be offset by increased revenues in addition to cost reductions (Klassen and McLaughlin, 1996). Environmental certifications offer a new basis of differentiation for the consumer. Costs stemming from materials waste and inefficient processes are minimized by firms that invest heavily in EMS. An international study found several benefits associated with the implementation of an EMS. Most firms reported cost savings due to resource efficiency and pollution prevention as well as a small number of market opportunities (Stegner, 2000). This leads to our second hypothesis:

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

2.3 Operating performance

Sroufe (2003) was able to demonstrate a significant positive impact of an integrated EMS on operations performance measures such as quality, reduced costs, position in the marketplace, and selling products in the international marketplace. In other words, the benefits outweigh the costs. Additional analysis demonstrated that firms utilizing a formal EMS perceive greater positive impacts on many dimensions of operations performance than those that have not certified their EMS (Melnyk *et al.*, 2003).

A 2008 study of Spanish SME food manufacturers by Martín-Tapia *et al.* (2008) confirmed a positive association between environmental proactivity and firm financial performance, which was consistent with prior studies of larger firms (Russo and Fouts, 1997; Klassen and Whybark, 1999; Dowell *et al.*, 2000; Martín-Tapia *et al.*, 2008). A related study of 123 Spanish food manufacturers (out of a universe of 1,556 firms) found that firm size increases the likelihood of a positive relationship between proactive environmental strategy and export intensity, a proxy for operating performance (Martín-Tapia *et al.*, 2010). This leads to our third hypothesis. The three hypotheses and the relationships among the constructs are shown in Figure 1:

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 environmental practices, was designed and adapted from the survey instrument used by Berns and his colleagues (2009). The survey was pretested with owners of 12 wineries in Northern California for suitability of questions and appropriate questionnaire length. For the main survey, we chose to collect data on-line, so we further pretested the questions on the web-based survey with 16 Green Wine Summit attendees in early Fall 2010. Minor adjustments were made to some questions to increase clarity and understanding.

We chose a single geographically defined sector in the USA to remove any possible distortion arising from peculiarities of different sectors or the biases that various regulations or national aid and subsidy policies, which governments and other agencies might introduce in other wine-growing regions across the globe. We did not find any

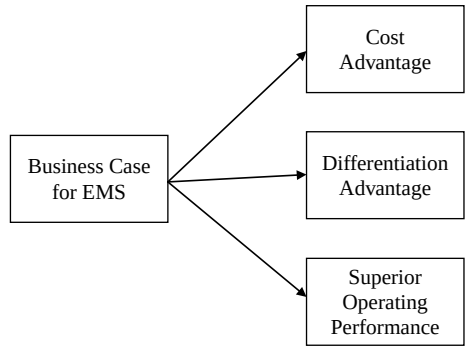

Figure 1.
Hypotheses of EMS impacts

significant differences between the descriptive characteristics of the firms included in the study (location, activities and size when available) and the original population.

In Fall 2010, an invitation to participate in the wine industry sustainability practices survey was emailed to a convenience sample of 1,469 US wineries, which was compiled from attendees at the annual Unified Wine and Grape Symposium in Sacramento, California. Follow-up emails were sent two weeks later. 98 usable, completed surveys were received, resulting in a response rate of 7 percent, which is not atypical of mail surveys (Pullman *et al.*, 2010). We adhered to Dillman's (1978, 1991) mail survey methodology, but the historically private nature of the wine industry may have posed an obstacle to gathering data about competitive strategy. Although this response rate was attenuated in comparison with more wide-ranging empirical studies, a number of recent published investigations into adoption of EMSs by SMEs in the food and wine sectors report similarly low response rates (Olsen and Thach, 2007; Martín-Tapia *et al.*, 2008; Pullman *et al.*, 2009). Non-response bias data were not collected for those respondents who started, but chose not to complete the questionnaire by closing their browser.

Company owners comprised 68 percent of the respondents; respondents were asked to check all that apply as to their relationship to their winery (Table II). Over 80 percent 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 represented are detailed in Table III.

4. Discussion of results

To compute the statistic analyses, SPSS 15.0 was used. Content validity of the measurement instrument was established mainly through the adoption of

	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

Note: Checked all that apply

Table II. Respondents

Age of winery		Production		Five-year growth rates, 2005-2010		
Years	(%)	Cases	(%)	Growth (%)	Case sales (%)	Profits (%)
≥100	3.0	>100,000	12.4	>20	28.4	12.5
50-99	7.1	50,001-100,000	3.1	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	2,001-20,000	38.1	1-4	15.8	16.7
<5	15.2	<2,000	39.2	0 or negative	15.8	36.5
Total	100		100		100	100

Table III. Respondent's winery demographics ($n = 98$)

existing instruments, while reliabilities of the constructs were performed using Cronbach's α coefficients. To address the hypotheses, multivariate analysis of variance (MANOVA) was used. Standard and multivariate assumptions were tested and found adequate to perform all appropriate analyses.

4.1 The case for EMS

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?" 22 percent indicated a clear case for EMS, 57 percent indicated no clear case, 16 percent were unsure, and 6 percent indicated that, they had tried adopting EMS but it was too difficult to develop and continue. The study 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. About 38 or 16.5 percent, 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 percent of the respondents indicated their wineries were sustainable from the start; 28 percent had recently adopted sustainable practices, 13 percent planned to adopt sustainable practices, but were not yet ready; 8 percent never adopted sustainable practices, but might be interested; and 3 percent 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 five-point 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 shown at Table IV.

We also asked the respondents to rate how the current economic downturn affected their organization's commitment to addressing sustainability issues using a seven-point Likert scale (significantly increased sustainability commitments (1) to our organization does not address sustainability (7)). "Clear EMS" had the higher mean at 2.50 and

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

Table IV.
Sustainability defined

"No Clear EMS" at 3.66. The differences between the two groups were significant with the one-way analysis of variance (ANOVA) F-test = 10.427, Sig. = 0.002. About 31 percent of those respondents who indicated "Clear EMS" had somewhat or significantly their increased sustainability commitments, while only 10.5 percent of those respondents who indicated "No Clear EMS" had somewhat or significantly their increased sustainability commitments.

4.2 EMS and generic strategy

Statements indicating cost leadership advantage and differentiation advantage were used in the analyses and found acceptable with Cronbach α scores of 0.89 and 0.78, respectively (Nunnally and Bernstein, 1994). MANOVA is appropriate to assess the differences between the group means ("Clear EMS" versus "No Clear EMS"), while maintaining control over the error rate and any intercorrelation among the dependent variables (Hair *et al.*, 1998). While the sample size for this study is small ($n = 98$); the recommended minimum cell size of 20 observations for the multivariate analyses was met (Hair *et al.*, 1998).

To test *H1*, the cost advantage indicators were entered as the dependent variables, and the codes for "Clear EMS" versus "No Clear EMS" were entered as the independent variable. All four of the omnibus MANOVA test statistics were significant at $\alpha = 0.05$ cutoff with F-statistic = 2.347, Sig. = 0.023 with an observed power of 0.887, offering support for *H1*. The univariate test results are shown in Table V. The group means for "Clear EMS" versus "No Clear EMS" are also shown for each of the cost advantage indicators.

To test *H2*, the differentiation advantage indicators were entered as the dependent variables in the model. Codes for "Clear EMS" versus "No Clear EMS" were entered as the independent variable. All four of the omnibus MANOVA test statistics were significant at $\alpha = 0.05$ cutoff with an F-statistic = 2.772 and Sig. = 0.035 with an observed power of 0.729, offering support for *H2*. The univariate test results are shown in Table VI. The group means are also shown for each of the differentiation advantage indicators.

4.3 EMS and performance

To test *H3*, winery growth rate in case sales over the past five years and winery growth rate in company profits over the past five years were entered as the dependent variables.

All cost advantage indicators analyzed	Clear EMS mean	No clear EMS mean	F	Sig.
Supply chain optimization	4.29	3.20	15.474	0.000*
Lower legal and regulatory risk	4.07	3.31	7.111	0.010*
Greater operational efficiency	4.14	3.51	5.011	0.029*
More potential sources of revenue	3.93	3.27	3.852	0.054
Lower cost of capital	3.57	2.94	3.593	0.063
Greater access to capital, financing and insurance	3.62	2.92	3.429	0.069
Employee recruitment, morale, retention	3.43	2.77	2.804	0.099
Lower financial and operating risk	3.86	3.29	2.753	0.102
Lower costs and taxes	3.86	3.59	0.955	0.167
More efficient use of resources	4.31	4.04	0.697	0.407

Note: *Statistically significant at $\alpha \leq 0.05$

Table V.
Cost advantage indicator univariate test results – *H1*

Codes for "Clear EMS" versus "No Clear EMS" were entered as the independent variable. The omnibus MANOVA test statistics were not significant at $\alpha = 0.05$ cutoff with an F-statistic = 0.570 and Sig. = 0.568, thus *H3* was not supported. No significant group differences in operational performance in winery growth rate in case sales or company profits over the past five years were found (Table VII).

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 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. However, the wineries with a clear business case for EMS did not perceive greater operational performance over those that did not have a clear business case for EMS. This study also found that wineries continue to incorporate 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, such as 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, but to a lesser degree.

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

Table VI.
Differentiation advantage indicator univariate test results – *H2*

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	0.011*
Stronger brand and greater pricing power	4.00	3.58	2.229	0.140
Ability to justify and charge a price premium for our products	3.57	3.21	1.304	0.258
Improved customer loyalty	3.86	3.87	0.001	0.977

Note: *Statistically significant at $\alpha \leq 0.05$

Table VII.
Case sales and profit univariate test results – *H3*

	Clear EMS mean	No clear EMS mean	F	Sig.
Case sales growth	2.94	2.76	0.198	0.658
Profits growth	3.41	3.59	0.349	0.556

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.

This study found that winery environmental actions and sustainable practices that comply with regulations may lower legal and regulatory risk. Compliance with government and overseas regulations and pre-emption of future regulations were found to be important drivers for sustainability for New Zealand wineries (Gabzdylova *et al.*, 2009). Those firms possessing a clear business case for EMS reported significantly greater operational efficiencies than those without. Melnyk and colleagues (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 and colleagues (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 percent, 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 10 percent of consumers reported using organic information, validating that eco-certification is not well understood by consumers). And yet if considering Orsato's (2006) findings, clear EMS processes and certifications, e.g. ISO 14001, by wineries could offer first-mover advantage into other markets, if only for a short period of time.

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 web site 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

Although prior linkages between EMS and performance have been shown (Waddock and Graves, 1997; Melnyk *et al.*, 2003), using winery growth rate in case sales over the past five years and winery growth rate in company profits over the past five years 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 Pullman and colleagues (2010) found that wineries had implemented a higher level of sustainable land practices than other food processors, the wineries did not show significant relationships between the use of environmental practices and improved performance. Adoption of environmental practices in the vineyard, however, did relate significantly to wine quality. Although results were mixed concerning market outcomes, a significant relationship was found between sustainable employee practices outcomes such as increased sales, serving new markets, improving customer satisfaction, and improving image. Wineries also showed no significant relationships between adoption of environmental practices and reduced costs.

5.4 Conclusions, implications for practitioners 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 percent of the respondents had indicated a "clear business case for EMS," over 75 percent of them indicated their wineries were either sustainable from the start or had recently adopted sustainable practices.

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). This way of thinking was also substantiated by one study respondent, who indicated a clear EMS, "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 percent 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 were adapted from Berns *et al.* (2009). While we felt they were relevant for this study, other measures, longer payback periods, or timing of the survey may be important for future studies. Due to the nature of an EMS, the costs are immediate and measurable for a firm, while the benefits are often long term and hard to measure (Stegner, 2000).

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. As with other research, wineries may not be experiencing the superior operating performance desired (Pullman *et al.*, 2010). 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.

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. We recognize the markets' sensitivity to environmental or sustainability issues may be different in countries other than the USA. Future investigations looking into other regions in the USA, 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. We found those respondents who had a clear business case for EMS maintained 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 does not negate the positive cost-benefit impacts for those implementing formal EMS.

Note

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

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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)

(continued)

7) How has the current economic downturn affected your organization's commitment to addressing sustainability initiatives? (Please select one)

Significantly increased sustainability commitments
Somewhat increased sustainability commitments
Business as usual, no change in sustainability commitments
Somewhat decreased sustainability commitments
Significantly increased sustainability commitments
No basis for making judgment
Our organization does not address sustainability

Corresponding author
Thomas Atkin can be contacted at: Tom.atkin@sonoma.edu