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REGIONAL WINE QUALITY REPUTATION: THE PERCEPTIONS AND POSSIBILITIES IN THE SHAWNEE HILLS AVA

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by

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MAJOR PROFESSORS: Dr. C. Matthew Rendleman and Dr. Bradley Taylor

There is a growing consumer preference for regional or "*terroir*" based products (Guy 2011). The designation of AVA status has the potential to increase the development of consumer identification with regional wine products. The presence of a distinguishing *terroir* is one of the prerequisites for the establishment of a federally recognized American Viticultural Area (AVA) (TTB 2012). The TTB granted the Shawnee Hills, located in southern Illinois, this designation at their request in 2006 (MKF 2005). The goal of this project was to determine the economic impact of a regional reputation on a wine-producing region. The project examined two California wine-producing regions progressing in wine quality development and with an established AVA designation and a wine culture in place, the Lodi AVA and the Central Coast AVA. A regression model was used to measure the source of these regions' growth in grower return per ton (price). Our results show the importance of achieving an AVA designation, an increase of $173.73 - $179.60 in grower return per ton, as well as the formation of regional wine quality program for that AVA, an increase of $165.81 - $372.88. A winery competiveness survey was administered to all owner/operators in the Shawnee Hills to determine whether the infrastructure was in place to sustain a regional wine quality program. The results found that Shawnee Hill's AVA winery owner/operators regard increases in regional tourism, growth in the U.S. wine market continuous

innovation, unique services and processes, and flow of information from customers to have the most enhancing effects on their businesses, and that confidence/trust in Illinois state political systems, tax systems, and administrative/bureaucratic regulations were the most constraining factors. Further the Shawnee Hills AVA has growing competition, yet consists of innovative winery owners. It may currently lack external financial support, but with a community focus on product differentiation, the Shawnee Hills AVA has a chance to capture a portion of the growing market for regional products.

DEDICATION

I would like to dedicate this thesis to the longevity of the Shawnee Hills AVA and the quality wines its unique *terroi*r can produce. Throughout this research process I have had the opportunity to meet many wonderful people, from winemakers and vineyard workers to sales staff and owners. All are their own unique persons yet each has a shared passion and dream for the success of Shawnee Hills. Without their cooperation and input, this thesis would not have reached the depth and exhibited the impact that we feel is presented.

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CHAPTER 1

INTRODUCTION

Since the end of Prohibition in the USA, wine consumption has grown by a noticeable 751 million gallons a year. United States wine consumption per resident increased by over 900% from 1934 to 2012 from 0.26 to 2.73 gallons and is trending up (Wine Institute 2011). Grapes are now the highest value crop in the country and the grape crop in the United States has more than tripled over the last two decades. In Illinois alone there are over 90 wineries (MKF Research LLC 2009). About 85% of these wineries have been established within the last fifteen years. The average annual production of Illinois wine is 357,000 gallons. The industry provides over 2,000 full-time employment positions. With total revenues of $247,513,000 and total wages paid of $71,466,000, the full economic impact is almost $319 million (MKF Research LLC 2009).

Many reasons have been identified as to why this resurgence of winegrape and wine production has occurred in Illinois. These include the new crop appeal, a growing understanding of which grape varieties are best suited to its *terroir*, a more fluid procurement process of out of state grapes and juice, and the rising demand for wine (MKF Research LLC 2006).

From the grower's perspective, the most important reason for the growing grape and wine production might be the product's profitability. When compared to the staple crops of Illinois, corn and soybeans, winegrapes are considerably more profitable per acre. Revenue from soybeans or corn can fall in the range of $300 to $400 an acre. Winegrape revenue can fall in the range of $4,000 to $6,000 an acre. This allows many vineyards to make a profit even after including labor costs (MKF Research LLC 2006).

The wineries and vineyards of Southern Illinois and specifically those within the Shawnee Hills American Viticulutural Area (AVA) are leading the way in the resurgence of wine in Illinois. Five of the top 17 counties that contain 54% of Illinois' vineyards are in part within the boundaries of the Shawnee Hills AVA including the top two grape producing counties, Jackson and Union counties, with 32% of all grapes planted within the southern region of the state. Of the top 17 counties that contain 62% of Illinois' wineries, five are again within the boundaries of the Shawnee Hills AVA, including the top two, Union and Jackson (Shoemaker and Campbell 2007). Furthermore the *terroir* of Southern Illinois is the most conducive to the growth of vinifera grapes that currently sell for higher prices than both natives and hybrids. Expanding the growth of vinifera grapes is of great importance to the maturation of the wine industry in the state (MKF Research LLC 2006).

The *terroir* of Southern Illinois is characterized by rolling hills with sandy and clay loam soils, which are both very favorable conditions for the growth of grapes. *Terroir* is a concept relating the sensory attributes of the wine to the environmental conditions in which the grapes are grown. The climate of Southern Illinois is more temperate; with low levels of frost. Its consistent summer breezes help to keep the grapes dry even with frequent showers. The favorable *terroir* elements supported wineries and vineyards, which began opening in the area in 1984 with Alto Vineyards. In 1995 enough wineries existed for the establishment of the Shawnee Hills Wine Trail, and in only seven years it had catered to over 100,000 visitors and grossed over $2 million. All of these factors contribute to Shawnee Hills' unique *terroir*, and are part of what encouraged the decision to petition the Alcohol and Tobacco Tax and Trade Bureau to become an American Viticulture Area, a petition was granted in December 2006 (MKF

Research LLC 2006). An AVA designation allows wineries to identify the geographical origin of the grapes used in their wine production, and prevents producers from outside the AVA from making false claims about the nature and origin of their own wines (Cross, Plantinga, and Stavins 2011).

Despite the rising revenues, job growth, and tax dollars that the wine industry of the Shawnee Hills AVA produces, it is struggling to develop the consumer interest that many industry experts feel its unique *terroir* could provide and its wines deserve. For example, the *terroir* of the wine industry in California accounted for over 199.6 million cases of wine with a retail value of $18.5 billion dollars. Many experts see the continued growth of the wine industry throughout all of the 50 U.S. states, as Americans are increasingly interested in lifestyles with food and wine and its current per capita consumption is only about 5% of that of France or Italy (Wine Institute 2011). The *terroir* of Southern Illinois is unlike any other in the world and has resulted in the production of high quality wines, many of which that have won awards at international wine competitions. The Shawnee Hills AVA is an area that has the foundations present for the capture of some of the growing American market share. Illinois is the fifth largest wine market in the United States and the city of Chicago is the third largest US metropolitan wine market (MKF Research LLC 2006).

Furthermore Americans are not only demanding more wine, they are demanding better wine, and there is potential for growth in the wine quality reputation of the Shawnee Hills where theoretically the best grapes in Illinois can be grown. However thus far this has not translated into national consumer recognition for the wines of the Shawnee Hills AVA as 70% of all cases of wine are sold in winery tasting rooms (Ward 2012), and 60% of all visitors to the tasting

rooms are local (defined as coming within 50 miles)(Smith, Davis, and Pike 2010). The present research is important because it will potentially help to find a way to bring broader consumer recognition to the 20 wineries in the Shawnee AVA and their wines. Furthermore as wine consumption and wine awareness continue to rise in the United States, the industry has the potential to facilitate overall economic growth.

The specific objective of the present research is to determine the most substantial method of improving the reputation of wine quality in the Shawnee Hills AVA. To accomplish the objective, American Viticultural Areas similar to the Shawnee Hills that possess a unique and advantageous *terroir*, while also exhibiting a similar trend of growth in wine production were selected for analysis. The areas chosen are the Lodi and the Central Coast AVAs, both located in California. These areas were chosen because only relatively recently did many consumers associate quality with their wines. Furthermore both the Lodi and the Central Coast areas were recommended by industry professionals based on common structural changes that led to increased price for grapes and mutual data availability. In examining these areas, we asked two primary questions: What were the structural changes in production or marketing that best explain or predict the change in grower's return per ton (price)? Are these effects greater than zero and statistically significant?

These data used were extracted from California grape crush report tables, which include all winegrapes crushed, and the weighted average grower returns per ton of grapes sold (NASS 2012). The structural events identified as potentially being most influential are 1) the approval of each region's AVA designation, 2) the formation of the regional wine industry groups, and 3) the creation of a regional wine quality program. To determine if any of these events had a

substantial impact on the region's grower return per ton a regression model was developed, specifically an inverse demand function, using dummy variables that linked particular structural changes in Lodi and the Central Coast in the crush reports to the prices paid to growers for the grapes harvested.

Since our data include nominal prices, a trend variable was tested. The effects of all other price influencing factors are captured by the trend variable, specifically inflation, consumer preferences and environmental changes.

The present research will help to identify events or strategies that helped improve the price of the winegrapes in the Lodi and Central Coast AVAs. It is widely understood that higher winegrape prices should be found in regions of higher quality winegrape production. Furthermore the Regulatory Flexibility Act provision within any U.S. Alcohol and Tobacco Tax and Trade Bureau (TTB). approved AVA petition states:

> *The proposed regulation imposes no new reporting, recordkeeping, or other administrative requirement. Any benefit derived from the use of a viticultural area name would be the result of a proprietor's efforts and consumer acceptance of wines from that area.*

AVA are much less detailed and proscriptive when compared to geographic appellation designations granted in many European wine regions which can dictate what grapes may be grown, maximum grape yields, alcohol level, irrigation, and other quality factors, before an appellation name may legally appear on a wine bottle label (Love 1997). The only requirement to use the AVA name on the wine label is that 85% of the wine must have come from grapes grown

within the geographical AVA boundaries (TTB 2012). Since AVAs were first introduced in 1982 many wineries in the U.S. are turning to more geographic designations to distinguish their wines and today there are well over 100 in the U.S. (Love 1997). Therefore this research should produce an introductory blueprint of growth from which the grape growers and wine producers in the Shawnee Hills AVA can learn. Using the knowledge from the present research analysis, efforts and investment dollars can be allocated to actions of economic impact, and the Shawnee Hills AVA can benefit growers, producers, and consumers.

A winery competiveness survey was administered to determine the key factors enhancing or constraining the competitive performance of wine businesses in the Shawnee Hills American Viticultural Area (AVA). All winery Owner/Operators within the Shawnee Hills American Viticultural Area received a copy of this survey. They were selected to participate in this study because of their knowledge of the area. Owner/Operators are also those most responsible for the success and failure of strategy and operations. The goal of the survey was to discover the strengths and weaknesses of the current business environment within the Shawnee Hills AVA, and determine whether the infrastructure was in place to sustain a regional wine quality program.

CHAPTER 2

PREVIOUS WORK

Cross, Plantinga, and Stavins (2011) attempted to place an economic value on *terroir* by conducting a hedonic pricing analysis of the sales of vineyards in Oregon's Willamette Valley, using data on vineyard value per acre, "vinevalue," provided by the Northwest Farm Credit Services. The results of their study showed no evidence of significant effects of a designated appellation on vineyard prices; however they did find that vineyard prices are strongly determined by a location within specific sub-AVAs. Furthermore they found the physical characteristics of vineyards are not priced implicitly in land markets, which could imply that large AVA designations do not have a direct connection to *terroir*. Still their results did show that *terroir* makes an economic difference to both consumers and producers. A premium was placed on all parcels sold within the sub AVAs and the bottle prices were relatively high which showed to the researchers that the consumers were willing to pay more for the chance to drink these AVA's wines (Cross, Plantinga, and Stavins 2011).

Consumers were willing to pay more for the chance to drink *terroir* influenced AVA wines(Cross, Plantinga, and Stavins 2011). The Lodi Rules Sustainable Winegrowing Program (SWP), was established in 1995 by the Lodi Winegrape Commission (LWC) with the goal of consistently transferring the *terroir* influences to their wines and effectively translating this to consumers. Hillis, Luebell, and Hoffman (2010) researched the winegrower perceptions of the LWC and its Lodi Rules Sustainable Winegrowing Program. Discovering the grower perceptions of this program was deemed important because similar programs have been already begun to be established at the California state level or soon will be established in other

winegrape growing regions and other agricultural commodities. Both surveys and semi-structured interviews were used to gather information on the perception of the program's success from the grower's perspective. Survey respondents were asked whether or not they participate in various LWC outreach and education activities, how successful they think the LWC has been across a range of objectives, and the degree to which they support local and statewide programs (Hillis, Luebell, and Hoffman 2010).

The results of the research showed participation in LWC activities ranges from over 90% of growers (reading the LWC newsletter) to less than 40% (completion of Lodi Rules third-party certification program), with lower participation in more resource intensive activities. Seventy percent of growers think the LWC has improved consumer perception of the region. They also rated the LWC's achievement of environmental objectives more highly than they did economic objectives, particularly reducing input costs and streamlining operations. Survey respondents were mostly supportive of the statewide California Sustainable Winegrowing Alliance, as well as their certification programs, but they did prefer the use of local programs (Hillis, Luebell, and Hoffman 2010).

The researchers thus concluded that growers are heavily influenced by economic factors, and therefore are more likely to avoid apparently costly program participation activities. Even with the improving consumer perception of the region, growers are struggling to associate financial success with the LWC and its SWP program. If the programs were able to more visibly reduce the cost of participation and more importantly demonstrate that an initial investment in time, money, or commitment can yield a benefit to growers in the long-term, then grower's perceptions may change (Hillis, Luebell, and Hoffman 2010).

Growers surveyed in Hillis, Luebell, and Hoffman's research are an important part of the wine industry community in the Lodi AVA, but they are not alone. Shaw, Luebell, and Ohmart (2011) conducted a study on the community aspect of regional regulations. The article analyzed the evolution and effectiveness of the Sustainable Winegrowing Program in Lodi, California. They sought to specifically discover the complementary effects of three different theories of wine-grape grower behavior; diffusion of innovation, cultural change, and social capital. The researchers hypothesized that participation in sustainable partnerships creates more positive attitudes toward such sustainable partnerships and increases adoption of such practices. In order to discover whether the relationship between program participation and sustainable practice adoption exists, the researchers created a regression model based on the findings of two separate surveys in 1998 and 2003 conducted by the Lodi Winegrape Commission. These surveys assessed grower's impressions of quality, timeliness, and usefulness of the Lodi Winegrape Commission's educational outreach programs (Shaw, Luebell, and Ohmart 2011).

The results of Shaw, Luebell, and Ohmart's regression analysis confirmed that participation in the Sustainable Winegrowing Program was positively associated with the adoption of sustainable practices. Although the results of the analysis were not sufficient to claim that partnerships are guaranteed to reach longer-term goals of sustainability, they do provide evidence of the necessary short-term goal of adoption. Furthermore, grape growers anticipate strong emergence of a green market for wine. This is important, as there exists a strong link between consumer perceptions of regional reputation and economic success those wine regions (Shaw, Luebell, and Ohmart 2011). This is consistent with the findings of Cross, Plantinga, and Stavins (2011) regarding consumer's willingness to pay more for wines based

upon their geographic designation.

International studies have been conducted analyzing quality control systems as well. Foti, Pilato, and Timpanaro (2011) conducted a specific assessment of the result of quality control systems in the Sicilian winemaking industry. They conducted a multi-variable analysis of information collected using ad hoc gathering instruments of principal components. They specifically looked at the implementation process of each quality program and the level of satisfaction reached by each company. They found that quality is an integral tool in the optimization of the management and production process. Furthermore, the reputation and the value of production of wine are increased. These effects accomplish a number of significant benefits such as breaking into new markets, guaranteeing product quality and safety, traceability, environmental protection, and the improvement of overall performance. They concluded that heightened consumer demand for higher quality and standardized products was a primary driver of this shift (Foti, Pilato, and Timpanaro 2011). This is consistent with the findings of both Cross, Plantinga, and Stavins (2011) and Shaw, Luebell, and Ohmart (2011), highlighting the importance of quality production and regional reputation across the global wine market.

Chiodo, Casolani, and Fantini (2011) published a paper analyzing how different aspects related to regulations can influence a consumer's quality perception and what value is attributed to those wine products. Unlike previous studies, which examined the effects of single quality factors, they sought to examine the product as a whole. They therefore utilized an economic methodology of conjoint analysis that considered both the combination of all characteristics of the wine, and the contribution of every factor to the creation of value for the consumer. Conjoint analysis allows researchers to determine the importance of specific attributes or aspects

of a product (Chiodo, Casolani, and Fantini 2011).

They hypothesized that consumers' preference for higher quality would allow for wineries to institute more restrictive rules and incur higher costs in order to differentiate their wines and achieve that higher quality. Specifically provisions in wine labeling and presentation, origin and quality identification would permit the consumer to separate higher quality products from lower quality products and differentiate their willingness to pay. However, this would only be possible if consumers were able to recognize these differences and assign a higher value to certain quality aspects. They felt that this was substantial as wine labeling and presentation can modify consumers' perceptions and preferences. Therefore they considered the following aspects related to regulation provisions that are often used by wineries to differentiate their products in labeling and presentation: organic farming, using additional producer organization brands (PDOs), specific indications about production methods such as name of producer and bottler, and the content of sulphor dioxide in the wines (Chiodo, Casolani, and Fantini 2011).

The results of Chiodo, Casolani, and Fantini confirmed that aspects of wine labeling and presentation directly linked to regulatory policies affect Italian consumer perception, especially when linked to quality control, naturality, and safety aspects. Furthermore, attributes such as the membership of a Protected Designations of Origin Consortium (DOC) and the indication of production methods, exhibit higher importance than the organic certification. In addition, the differentiated attribution of quality to brand DOC versus PDO accentuates the need for government policymakers to inform consumers in more efficient ways. Confusion needs to be reduced. This answers a portion of the question posed by grape growers in Hillis, Hoffman, and Luebell's study (2010) regarding whether the investment in time, money, and commitment can

yield a benefit to growers long-term, as it shows that more restrictive rules and the incurring of higher costs is sometimes necessary in order to differentiate wines and achieve higher quality.

Van Rooyen, Esterhuizen, and Stroebel (2011) conducting a study analyzing the competitive performance of the South African wine industry. Their article employed a four-step framework to measure and analyze the South African wine industry with the goal of understanding the evolving situation in which the wine industry resides. The focus of their study was on the environment in which the wine industry firm executives make decisions.

The first step in their study of the South African wine industry was to measure competitive performance through the Wine Competiveness Rating (WCR), which was based on trade performance as measured by the Relative Trade Advantage (RTA) method (Balassa 1989). The second step was to identify the major factors impacting competitive performance through interviews with industry experts and through a Wine Executive Survey (WES). The WES divided the survey into five sections: *production factors; related and supporting industries; firm strategy, structure and rivalry; government support and policies; demand conditions; chance factors.* The survey respondents were asked to rate factors within each section as either (1) mostly constraining, (2) modestly enhancing, or (3) most enhancing. The third step was to analyze the major factors and establish Determinants of Competiveness (DC), using Michael Porter's (1990) "new" competiveness theory. The final step was to use the information obtained in the first three steps to indentify and analyze changes over time in the "competitive space" of the South African wine industry, then determine an industry agenda for improving competitive performance.

The results of Van Rooyen, Esterhuizen, and Stroebel (2011) Wine Executive Survey compared the results of the same survey instrument administered in both 2005 and 2008. The *production factors* with enhancing effects in both years were the availability/cost of low-level skilled labor, the quality and availability of technology, water availability and the general efficiency of infrastructure. However from 2005 to 2008 most factors declined. In 2005 the most constraining factors were the high cost of financing and labor administration cost. In 2008 these were also included, in addition to the quality of low-skilled labor, cost of transport, infrastructure and technology, availability of skilled labor and the overall cost of doing business.

The results of the section regarding *related and supporting industries* were rated a 1.9 overall in 2005 and then declined further to a competiveness rating of 1.6 in 2008. Most factors showed declining ratings, with electricity supplies recording the biggest decline. The prestige of supporting research institutions and the sustainability of local suppliers were rated as the highest contributors in both periods.

The results of the section regarding *firm strategy, structure and rivalry* were rated an average overall score of 2.5 in 2005 and then in 2008 an average score of 2.1. Although a decline from 2005 to 2008 was recorded, a positive status is generally found with this determinant, and the researcher related the decline to tighter market conditions constraining innovation and progress (Van Rooyen, Esterhuizen, and Stroebel 2011). In both periods most factors had enhancing impacts with the most enhancing being the ease of entry of new competitors, international entry into the local market, affordability of high quality products and the fierce competition in the local market. In 2008 the only constraining factors, even though only slight constraining, were a declining expenditure on R&D and incentives to support management

performance.

The results of the section regarding *government support and policies* were rated an average score of 1.3 in 2005, but improved 2008 recorded an average score of 1.5. Although still constraining this shows a positive trend upward which Van Rooyen, Esterhuizen, and Stroebel attributed to many policy and government level interactions by the industry such as the restructuring of the wine industry's body to become more representative. In both years the major constraining factors identified were administrative regulations, the competence of the personnel in the public sector, the tax system's impact on investments and risk taking, and the resource policies related to land.

The results of the section regarding *demand conditions* were rated an enhancing average score of 2 in 2005, but declined to a somewhat constraining average score of 1.8 in 2008. Van Rooyen, Esterhuizen, and Stroebel (2011) partially attribute this decline to currency revaluation and fluctuations and tighter competition in global markets. In both 2005 and 2008 the most constraining factors were the size of and growth in the local market. Although the factors related to the consumers of South African wine being knowledgeable, demanding and buying environmentally friendly products and being concerned of ethics and the integrity of production were recorded as exhibiting modestly enhancing impacts on the competiveness of the industry.

Finally the results of the section regarding *chance factors* were rated as the most constraining to competitive performance. In 2005 the average rating was 1.3 and in 2008 the average rating was a 1.4. The most constraining factors in both 2005 and 2008 were the South African exchange rate, the global political/economic developments, the cost of crime, and the

cost of HIV/Aids.

Based on the results of their analyses, Van Rooyen, Esterhuizen, and Stroebel (2011) concluded that South Africa's wines are increasingly internationally competitive, with a strong positive trend since 1990. Recently however, this trend has declined. In order to attempt to reverse this downward trend, the researchers identified the role of regulation and the presence of supportive government policy environment to be highly relevant for the competitive performance of the industry. To facilitate this the researchers recommended more "lobby discussions" and to build more trusting relationship between industry and government (Van Rooyen, Esterhuizen, and Stroebel 2011).

Rendleman, Peterson, Menke, and Beck (2002) used an IMPLAN impact analysis to measure the contribution of the grape and wine sectors of the Illinois economy. They then divided the areas of impact into sections: effect of Illinois grown grapes, the effect of wine sales using only Illinois grown grapes, and the total effect of Illinois wine sales. They made an assumption based on the structure of the model that the more inputs were purchased locally then the greater economic contribution to the state. They then established a regional purchase coefficient (RPC) of the ratio of local to total purchases of grapes. Grapes are the major input in Illinois wine, therefore they were chosen as the RPC. The RPC was the portion of total input used that was either produced by a local winery or grape grower. They then studied the economic contributions of Illinois grapes alone and discovered that in 2000, 530 tons of grapes were produced resulting in $477,000 in sales, with the price per ton falling in the range of $600 to $1600 per ton. These results represent $333,839 in value added. As previously mentioned, the grape sector is connected to the rest of the economy through the purchasing of inputs and the

additional income produced by sales that is spent. Thus with these factors included, the total economic impact of grapes was $876,370 (a combination of sales (direct), input purchases (indirect), and the induced impact (sales revenue spent) (Rendleman et al. 2002).

Next the researchers examined the impact of wine produced from Illinois grown grapes. They discovered that the 530 tons of Illinois grapes produced in 2000 went on to make approximately 74,000 gallons of wine resulting in a total impact of $6,516,405. This total impact includes $3,353,395 of direct winery sales, plus $1,076,152 of indirect sales, and $2,086,858 of induced impact (Rendleman et al. 2002).

Only 31% of all Illinois wines in 2000 were produced using nothing but Illinois grapes. The total output effect is $18,998,366, with the indirect portion equaling $2,209,771 and the induced effect equaling $6,013,443 (Rendleman et al. 2002).

The researchers concluded through their IMPLAN analysis that if the existing trends in Illinois wine continued, by 2005 Illinois grape production would equal the amount of 857 acres, a necessary amount to meet current winery needs, thus eliminating most out of state grape importation. They hypothesized that if wine production continued to grow at the rate of 6% per year there would be 31 wineries by 2002 (Rendleman et al. 2002).

Through the information provided by NASS conducted in 2011 we now know that these estimates have been easily surpassed as there were 1066 grape producing acres, and 105 wineries (Ward 2012). However this has not eliminated the need to import a majority of grapes used in production as Rendleman et al. hypothesized. As of 2011 only 44% of total gallons produced of Illinois wine is the result of Illinois grapes. However in the southern region of the state 83% of

total gallons produced is the result of Illinois grapes (Ward 2012). This is a favorable percentage as many midwest wine quality programs rely on the use of regional fruit as a source of differentiation (Edwards 2011).

CHAPTER 3
METHODOLOGY

Methodology: AVA Structural Change Regression Models

In order to investigate the relationship between the dependent variable, weighted average price per ton, and the identified structural change explanatory variables, a regression model was created. The model used in this research, WeightedAveragePricePerTon = B0+TotalCrushx1+AVAx2+ IndustryGroupx3+WineQualityProgramx4+Trendx5+e, was created after much thought, literature review, and a comparison of common structural changes in the Lodi and Central Coast AVAs. A strong link exists between consumer perceptions of regional reputations and the economic success of that region (Shaw, Luebell, and Ohmart 2011). Each of the independent variables represents a source of regional identification. Furthermore each is an example of TTB approved AVA efforts to derive benefits from the use of the viticultural area name and increase consumer acceptance of their wines (TTB 2012). Weighted average price per ton is the dependent variable, and total crush, AVA establishment, industry group establishment, wine quality program creation, and the trend are all explanatory variables. The B0 variable is the intercept and crosses the weighted average price per ton axis; e is the error term.

This model relies on a time series analysis using California Crush Reports from 1976-2011 (NASS 2012) (Appendix A). The model was run separately for each AVA in order to discover possible correlation. The dependent variable in the model, weighted average grower return per ton (price), was assumed to represent quality. The B0 variable is the weighted average

price per ton if none of the structural changes or trend variable effects existed. The B1 variable, total tonnage of grapes crushed, each year was expected to exhibit a negative effect because it elastic commodity, and thus as the volume of production increases price will fall (Houthakker and Taylor 1970). Furthermore dummy or binary variable analysis was utilized in the construction of this model as it relates to each structural change. Therefore zeros were placed into the data for every year prior to each event's onset and ones thereafter in an attempt to create a before and after comparison. The trend variable was also tested in an increasing column from 1 to 36, in an attempt to capture any other price influencing effects, including inflation, change in consumer preferences, and environmental conditions (Cameron 2005).

The B1 variable represents the California Crush Report production totals or amount of grapes harvested and crushed each year. We expect B1 to have a minimal effect because of the elastic quality of the grape commodity market and the greater effect associated with quality over quantity (Johnson 1989, 121-122). In the 18th century when the Cistercian monks developed many viticultural practices in Europe including the concept of pruning for quality over quantity. Around this time the concept of *terroir* emerged too, as wines from particular places began to develop a reputation for uniqueness. Varietals were studied more closely to see which grape varieties were the most suitable for a particular *terroir* (Johnson 1989, 121-122).

The B2 variable represents the first structural change, the approval of the Lodi AVA in 1986, and the Central Coast AVA in 1985 ("American Viticultural Areas" 2011). An approval may be granted by the Department of the Treasury's Alcohol and Tobacco Tax and Trade Bureau once a formal petition, review, comment, and occasionally a hearing process is completed. It is important to achieve this distinction because it regulates the labeling of wine to

specify the area of origin of the wine for the consumer. Thus AVA designation provides the consumer with accurate information regarding the product's identity and prohibits the use of misleading information by producers from outside the AVA. The geographical uniqueness of each place is critical to the approval of each AVA. These AVA designations allow wine producers and consumers to attribute a given quality, reputation, or other characteristic of the wines produced from grapes to a specific AVA. It is the uniqueness of the region and the potential to produce quality wines from it that is one of the core drivers behind heightened consumer interest in a region (Elliott-Fisk 2012). The Lodi AVA is located in the Central Valley of California, at the northern edge of the San Joaquin Valley east of San Francisco Bay. It includes 551,000 acres (223,000 ha) of which 90,000 acres (36,000 ha) are currently planted with wine grapes. The Central Coast AVA is a California American Viticultural Area that spans from Santa Barbara County in the south to the San Francisco Bay Area in the north. It includes around 4,000,000 acres of which100,000 acres (400 km^2) are currently planted with winegrapes (Appellation America 2012).

In the analysis of the Lodi AVA, the B2 variable represents the formation of the regional Winegrape Commission (LWWC), in 1991 by the Lodi winegrape growers.

The Lodi growers set forth three primary goals for the LWWC:

1) Differentiate Lodi in the marketplace as a producer of premium winegrapes and wine.

2) Fund research on local viticulture issues assisting Lodi growers to produce higher quality winegrapes.

3) Create and implement an area-wide integrated pest management program.

The LWWC is funded based on an assessment on the annual value of growers' winegrape crops (Cliff Ohmart, Lodi Winegrape Commission mailing list message, January, 2005).

In the analysis of the Central Coast AVA, the B2 variable represents the formation of the Central Coast Vineyard Team (CCVT), in 1994. The founders of the CCVT recognized a need for more progressive and regionally based research and education. They wanted to guide growers towards environmentally and economically sustainable farming practices, practices they theorized would result in higher quality wines. The CCVT programs are funded through private membership dollars, events, donations, and grants/contracts (Central Coast Vineyard Team 2012).

The B3 variable represents the establishment of the Lodi Rules Sustainable Winegrowing Program (SWP) by the LWWC. The SWP goals were centered on promoting grower adoption of the best management practices via informational meetings, workshops, vineyard demonstrations and research, the Lodi Winegrower's Workbook for sustainability self –assessment, and the Lodi Rules for Sustainable Winegrowing third-party certification program. The LWWC thinking was by developing a sustainable vision for one's farm is important because it provides a template for sustainability (Hillis, Luebell, and Hoffman 2010). The researchers sought to increase the time scale of grower goal development.

In our Central Coast regression model the B3 variable represents the establishment of the Sustainable in Practice Certification Standards (SIP) by the CCVT. The CCVT formed the foundation for what would later become the SIP program in 1996 with the award-winning Positive Points System. The SIP Certification's goals start with a quality commitment to

protecting both natural and human resources. Growers and winemakers recognize that attentive fruit production and care for workers' well-being are important components of quality wine. Habitat conservation, energy efficiency, pest management, water conservation, economic stability, and human resources are some of the key elements of the program. The standards look at the farm in its entirety: the worker, soil fertility, cover crops, wildlife, native plants, irrigation, and more (Central Coast Vineyard Team"Vineyard Team" 2012).

The coefficients of all structural change variables in the present analysis were hypothesized to be positive. Since each structural event change had a regional economic development rationale motivating their approval, then each program should exhibit a significant impact on price. It is our hypothesis that the regional quality wine standards programs will exhibit the most substantial impact from zero. We believe the Regulatory Flexibility Act within each TTB petition will prevent the most substantial effect to be associated with the AVA variable. There are no accompanying regulations to AVA after approval, and the quality reputation is then left to the opinion of the consumer ("American Viticultural Areas" 2011). Quality reputation in the uncertain wine buying process is important as it helps to reduce the risk associated with the potential purchase of a low quality wine. This increases the buyer's confidence in the wine's consistency too (Elliott-Fisk 2012).

Furthermore, this proposition is based upon several articles in the literature review. Specifically the journal articles by Cross, Plantinga, and Stavins; Foti, Pilato, and Timpanaro; and Chiodo, Casolani, and Fantini which detail the comprehensiveness of standards, and the effects of regional quality reputation on consumers. Also the results of several other research studies conducted by Hillis, Luebell, and Hoffman and Shaw, Luebell, and Ohmart that analyzed

the impacts and effects of the Lodi Rules Sustainable Winegrowing Program. The assumption made in this analysis was to rely on a price dependent model because of the assumed connection between quality and price in the winegrape market. This is again due to the pruning off of excess fruit prior to harvest in an attempt to boost quality. We also make the assumption that this will result in a negative coefficient on the crush or production variable. Both models were run using SPSS statistical software.

Methodology: Winery Competiveness Survey

We also conducted a wine competiveness survey based on a similar study conducted by Van Rooyen, Esterhuizen, and Stroebel (2011), to discover the strengths and weaknesses of the current business environment within the Shawnee Hills AVA, and determine whether the infrastructure was in place to sustain a regional wine quality program. The specific aim of this survey is to understand key factors influencing the competitive performance of wine businesses in the Shawnee Hills American Viticultural Area (AVA). Competitive performance is the ability to sustain sales and growth against competition (Van Rooyen, Esterhuizen, and Stroebel 2011).

The focus of this inquiry was the individual wineries. As with all firms, wineries are competitive when they are able to continue to grow their sales and improve their product (i.e., wine) quality in today's global market environment. Owners and operators were surveyed because they were directly responsible for the success and failure of strategy and operations. With this knowledge, the entire Shawnee Hills AVA will be better informed as to where its strengths and weaknesses lie, and where additional investment might be best made. The wine industry is unpredictable and answers to these questions are important as they provide the basis

for understanding this evolving situation, while helping to compete for survival and growth (Porter 1990).

Our survey consisted of five total sections of related factors, four identified by the economist Michael Porter who grouped these key determinants of competitive performance into the "Porter Diamond." (Porter 1990)(Appendix B). Section one was *production factors*, which examined the industry's endowment in factors of production, such as climate, terroir, skilled labor, infrastructure, etc. necessary to compete. Section two, *relating and supporting industries*, looked into the presence or absence of competitive suppliers and other related industries. Section three looked into *firm strategy, structure and rivalry* or the way companies are created, organized and managed, as well as the nature of domestic rivalry. Section four analyzed *government support and policy*. This section was included because like in the South African wine industry, governments connected to the Shawnee Hills AVA can influence each of the above determinants, either positively or negatively, through policies and the environment that is created, funding support and the provision of public goods to support private operational capacity and social stability. The final section, section five, looked into *demand conditions* or the nature, changes and knowledge of the market demand for the industry's products or service. A section analyzing "chance" factors was omitted because unlike the South African wine industry the Shawnee Hills is not greatly affected by such factors as changes in currency values or external factors impacting costs, such as crime and health situations (HIV/Aids) (Van Rooyen, Esterhuizen, and Stroebel 2011). The participants were then asked rate the above factors impacting their competitive performance using this assigned scale: **(5)** is mostly enhancing, (**4)** is modestly enhancing, **(3)** is neutral impact, **(2)** is modestly constraining, and **(1)** is mostly

constraining. All nineteen winery Owner/Operators within the Shawnee Hills American Viticultural Area received a copy of the survey. They were instructed to interpret each factor as they understood it and to rate each factor as it applied to their particular winery.

The survey was later collected with a rate of participation of 90%, 17 out of 19 total wineries in the Shawnee Hills AVA. The data was then analyzed in clustered factor groups created using demographic information. The first cluster looked at the results as a whole, without any restrictions. The second cluster compared the results of wineries with a solo owner/operators (SOLO) with those that were owned/operated by multiple persons (MULTI). The third cluster separated the winery owner/operator who used themselves as the primary labor source (WM) from those that employed labor to perform the winemaking tasks (NWM). The fourth cluster number of years the winery had been open: one to five years (1-5), six to ten years (6-10), or ten plus years (10+). Survey questions were clustered with a specific aim of discovering the strengths and weaknesses of the current business environment in the Shawnee Hills AVA, and discover if the infrastructure was in place to sustain a regional wine quality program.

Important survey factors of note included those related to government support both locally and statewide (Van Rooyen, Esterhuizen, and Stroebel 2011), belief or opinions on developmental innovation and research, collaborative relationships with research institutions, community cohesiveness especially between commercial grape growers and wineries, and the current state of grape supply. These factors were included in the survey instrument because all were common points of industry importance found in studies of other wine industry regions

where quality assurance programs (Hillis, Hoffman, and Luebell 2010)(Shaw, Luebell, and Ohmart 2011), have been successful, such as the Lodi and Central Coast AVAs.

CHAPTER 4

RESULTS & DISCUSSION

Results: AVA Structural Change Regression Models

The Lodi AVA analysis shows the approval of the AVA designation had the most substantial impact, $173.73 per ton, on the weighted average grower return per ton (price)(Table 1).

Table 1: Regression Model Output for Lodi AVA Model: Using California Crush Reports From 1976-2011 to Examine Effects of Regional Variables That Affect Price of Winegrapes

LODI MODEL	***Unstandardized Beta***	***Standard Error***	***Standardized Beta***	***T-value***	***Significance***
(Constant)	229.248*	28.078		8.165	0.000
Production (Crush)	0.000	0.000	-0.629	-2.424	0.022
AVA	$173.73*	45.049	0.537	3.856*	0.001
Industry Group	$98.41	45.451	0.335	2.165	0.038
Quality Program	$165.81*	52.038	0.568	3.186*	0.003
TREND	$2.13	4.463	0.153	0.478	0.636

All results are significant at the 0.01 level and * denotes significance.

Although this result does not confirm our hypothesis that the most substantial impact would be the result of the regional quality wine program, it clearly shows the value of achieving AVA status for a wine region. The regression constant, $229.248, is not determined by the value of the structural changes in the industry; it represents the amount of total price change per ton not determined by our structural change variables.

Although the AVA variable exhibited the most substantial effect on price (Table 1), the creation of the regional quality wine program also exhibited a very substantial effect, $165.81, on the weighted average grower return per ton (price). This substantial impact on price shows the importance of expanding and improving a region after it has achieved an AVA status.

The formation of the LWWC, $98.41 per ton, had a smaller, but significant impact compared to the AVA and regional quality wine program variables (Table 1). But the trend variable had no impact. Furthermore the impact of the total tons crushed (CRUSH) was found to be negative. This confirms our choice of a price dependent model due to the negative effect of quantity on price in the winegrape market.

The creation of the regional quality wine program in the California Central Coast AVA exhibited the most substantial impact, $372.88 per ton (Table 2), on the weighted average grower return per ton and confirms the hypothesis that the regional quality wine program variable would exhibit the most substantial impact. Although the creation of the regional quality wine standards program variable exhibited the most significant effect, the establishment of the Central Coast AVA, $179.60 per ton, also exhibited a very substantial effect on the weighted average grower return per ton. This suggests the importance of achieving the American Viticultural Area status

as it may have acted as a facilitator for each of the events that followed (Love 1997). In both cases it appears important to achieve an AVA status and develop a regional quality wine standards program. However in the case of the Central Coast the regional wine quality standards program was considerably more substantial.

Table 2: Regression Model Output for Central Coast AVA Model: Using California Crush Reports From 1976-2011 to Examine Effects of Regional Variables that That Affect Price of Winegrapes

Central Coast MODEL	***Unstandardized Beta***	***Standard Error***	***Standardized Beta***	***T-value***	***Significance***
(Constant)	479.643*	54.165		8.855	0.000
Production (Crush)	-0.001	0.000	-0.327	-2.274	0.030
AVA	$179.60*	79.275	0.235	2.266*	0.031
Industry Organization	$138.13	100.381	0.209	1.376	0.179
Quality Program	$372.88*	104.541	0.559	3.567*	0.001
TREND	$10.35	7.379	0.325	1.402	0.171

All results are significant at the 0.01 level and * denotes significance.

The formation of the CCVT, $138.13 per ton, had a smaller but significant impact compared to the AVA and regional wine quality program variables (Table 2). But the Trend variable had no impact. The impact of the total tons crushed (CRUSH) was found to be negative confirming our assumption to use a price dependent model.

Therefore, it is our conclusion based on the results of these analyses that it is necessary for a developing wine region to both achieve AVA designation status and to implement a regional quality wine program. To establish a sequence of events, it would appear helpful for a region to first achieve AVA status. It differs from earlier research conducted by Cross, Plantinga, and Stavins (2011) which stated that large AVA designations do not affect prices, the present analysis suggests that it has a substantial effect. Next, because the AVA designation does not carry any quality regulatory features and each AVA's reputation is then based on perceptions, each region would be best served by creating its own quality wine standards program. This confirms earlier research conducted by Shaw, Luebell, and Ohmart (2011) that cited the importance of establishing a link between consumer perceptions of regional reputation as it directly affects the economic success of the region. In both the Lodi and Central Coast AVA models the impact of the regional quality wine standards programs were both statistically significant, and in the case of the Central Coast model it proved to be the overwhelming economic driver behind the growth in its weighted average return per ton. Furthermore the analysis spans a 35 year period and suggests that grower investment in time, money, and commitment can yield a long term benefit answering the question posed by Lodi growers (Hillis, Hoffman, and Luebell 2010). Grape growers in the Shawnee Hills are of a similar mindset in that they too are heavily influenced by perceived economic factors in their decision-making.

It should be noted that each of these programs included a sustainable agriculture component. Sustainable agriculture involves using site-specific principles of ecology, the study of relationships between organisms and their environment, in order to sustain farming long term (Gold 2009). However it is our interpretation that at least in the short-term this component appears to offer mainly marketing benefits as it serves as a source of product differentiation. As previously noted, in the wine industry, regional reputations exhibit a strong link to economic returns. In the Lodi AVA, the creators aimed to build a regional reputation for both wine quality and sustainability as a strategy for competing against more recognized California wine regions (Shaw, Luebell, and Ohmart 2011). In the Midwest wineries have continually battled a long-held perception that the best U.S. wines come from California, and in an attempt to develop a market differentiation strategy several Midwestern states, beginning in Ohio, developed, or are developing, regional quality wines programs that recognize state-grown wines and promote them as an alternative to California (Edwards 2011). Furthermore in California, winegrowing regions anticipate a stronger emergence of a new market for sustainable products. In the long term higher quality should result, but in the short term they are competing to establish regional reputations that will capture this market share and increase economic returns (Shaw, Luebell, and Ohmart 2011).

Results: Winery Competiveness Survey

The factors in the tables (Appendix C) are the averaged results of the survey analysis and they are presented first as an overall average result of all 17 winery owner/operator survey respondents and their relevant clusters. They were grouped together using cluster analysis created using demographic information. All were clustered with a specific aim of discovering the

strengths and weaknesses of the current business environment in the Shawnee Hills AVA, and to discover if the infrastructure was in place to sustain a regional wine quality program.

The three most enhancing factors overall in the Shawnee Hills AVA wine industry in 2013 in descending order were:

- regional tourism increase;
- growth in the United States wine market; continuous innovation; *
- unique services and processes; flow of information from customers; *
  (* = Factors tied)

The three most constraining factors overall in the Shawnee Hills AVA wine industry in 2013 in descending order were:

- confidence/trust in state political system
- tax system
- administrative/bureaucratic regulations

Table 3: Averaged Overall Key Determinants Results of Winery Competiveness Survey of Winery Owner/Operators in the Shawnee Hills AVA

	Overall	SOLO	MULTI	WM	NWM	1- 5	6 - 10	10 +
PRODUCTION FACTORS	2.7	2.6	2.8	2.5	3.0	2.5	2.9	2.5
RELATED & SUPPORTING INDUSTRIES	3.1	3.0	3.3	3.1	3.2	3.0	3.2	3.2
FIRM STRATEGY, STRUCTURE, & RIVALRY	3.1	3.0	3.3	3.1	3.2	3.1	3.0	3.3
GOVERNMENT SUPPORT & POLICIES	2.3	2.3	2.3	2.2	2.5	2.3	2.4	2.1
DEMAND CONDITIONS	3.1	2.9	3.5	3.1	3.3	3.3	2.9	3.3

***Ratings:** 1= mostly constraining; 2 = mildly constraining; 3 = neutral; 4 = mildly enhancing; 5 = mostly enhancing

***Legend:** All respondents = Overall; Solo owner = SOLO; Multiple Owners = MULTI; Owner performs winemaking tasks = WM; Owner hires labor to perform winemaking tasks = NWM; Number of years in business = 1-5, 6-10, 10+

*Sample size = 17 total respondents

The majority of the production factor conditions in all clusters (Table 3) were constraining which indicates that the production environment currently in the Shawnee Hills

could be improved. The factors with the most constraining effect (Appendix C) on the competiveness of the Shawnee Hills AVA were the *cost of transport* and the *overall cost of doing business*. This is consistent with the results of the Wine Executive Survey conducted by Van Rooyen, Esterhuizen, and Stroebel (2011) on the competiveness of the South African wine industry. The *overall cost of doing business* was found to be a constraining factor in all clusters in Table 4a (Appendix C). Although *availability of quality technology*, *quality of technology*, and *availability of water for industrial purposes* were all neutral in the overall column, it is worth noting that in both the MULTI and NWM clusters these factors were even higher, bordering on modestly enhancing. It is also interesting to note that in the NWM cluster the *availability of skilled labor, the quality of skilled labor,* and *the availability of low-level skilled labor* were all either securely neutral or enhancing. This shows the importance non-winemaking owners put on the production process as it pertains to labor, and the appreciation they have for those employed to perform it. Skilled labor, especially as it applies to the grape growing and winemaking process, is essential to the development of any quality assurance program (Cliff Ohmart, Lodi Winegrape Commission mailing list message, January, 2005).

A final note on production factors should be discussed regarding the differences between those wineries that have been open for 1-5 years and those open 10 + years. The *availability of skilled labor* and the *cost of infrastructure* were found to be to be very constraining for wineries open 1-5 years. These variables could both be attributed to the costly process of establishing a business. However, wineries that had been in business 10 + years exhibited the signs of growth such as highly constraining factors of *cost of transport* and *overall cost of doing business*. These could show the difficulties associated with the process of business expansion. These older

wineries could have greater levels of production, which might require employing a distributor, which would increase overall costs, especially transport costs. These constraining factors are not unique to the Shawnee Hills (Van Rooyen, Esterhuizen, and Stroebel 2011).

The factors within the relating and supporting industries section were predominantly neutral. The *long-term outlook of local grape suppliers* in the overall cluster (Table 4b, Appendix C) is the most constraining of all related & supporting industry factors. This could result in a shortage of grapes in the future. Grape supply is important as many midwest wine quality programs rely on the use of regional fruit as a source of differentiation (Edwards 2011). However it should be noted that in 10+ years in business column the *long-term outlook of local grape suppliers* was securely a neutral factor. This could mean that the longer a winery is in business the more established both its relationships with local suppliers and its own vineyard production becomes. Both of these outcomes would ease the fears associated with a shortage. In addition, the relationship between commercial grape growers and wineries must be secure and well defined if any wine quality program is to be sustainable (Shaw, Luebell, and Ohmart 2011), as a common requirement of many regional wine quality programs is the reliance on AVA produced fruit. Furthermore the sustainability of local suppliers was seen as an enhancing factor on the competiveness of a wine region (Van Rooyen, Esterhuizen, and Stroebel 2011).

Within the NWM cluster (Table 4b) *collaboration with research institutions in Research & Development* (R&D) was securely neutral, however this was a constraining factor within the WM cluster. This should be seen as an area of potential improvement. In order for wine quality to be improved, an environment of enhancing collaboration between research institutions such as Southern Illinois University and the winery owners, especially those who are the winemakers,

must be established. The support of local research institutions such as universities can greatly aid both the funding and research development of wine quality programs (Hillis, Hoffman, and Luebell 2010). For example, the Lodi AVA wine quality program relied greatly on the collaborative efforts with the University of California-Davis in regulation formation and participant education, and the South African wine industry considers the status of their local research institutions to be an enhancing factor (Van Rooyen, Esterhuizen, and Stroebel 2011).

A final note of comparison with the related and supporting industries section between wineries that have been open for 1-5 years, 1-6 years and those with 10 + years in business regards the factor *supply of electricity*. Wineries with 1-5 years of operation found the *supply of electricity* to be an enhancing factor. However, those in business 6-10 or 10+ years found this factor to be of relatively neutral impact, which could be attributed to an increase in size and thus electricity use as the wineries grew older.

The factors in Table 3 of all Firm Strategy, Structure, and Rivalry factors were predominantly neutral. The most enhancing factors across all clusters in (Table 4c, Appendix C) were *continuous innovation, unique services and processes*, and the *flow of information from customers.* This is an encouraging sign, as positive winery owner opinions in relation to both innovation and uniqueness are essential to the development of a differentiation strategy such as a wine quality assurance program (Love 1997). The most constraining factors were often associated with competition, such as the *entry of new competitors* and *neighboring wine region product entry in local market.* Intense competition in local markets has resulted in enhancing characteristics in other markets by raising expectations for quality (Van Rooyen, Esterhuizen, and Stroebel 2011).

Within the firm strategy, structure, and rivalry (Table 4c), concerning expenditure on *research and development* a noticeable difference exists between the WM and NWM clusters. It appears that those owner/operators who also make the wine do not consider expenditures on R&D in both the winery and the vineyard to be as constraining as their counterparts who do not make the wine. It would be a of greater value to the development of wine quality program and thus the Shawnee Hills AVA if a more positive opinion on *research and development* strategies could be established.

We also analyzed the differences between wineries that have been open for 1-5 years, 1-6 years, and those with 10 + years in business (Table 4c). In this section of the survey, wineries with 1-5 years of business found the factor *regional industry structure and rivalry* to be constraining whereas owners whose wineries had been open 6+ years reported experiencing a neutral effect. Community cohesiveness must be improved as participation in regional partnerships creates more positive attitudes towards such partnerships and increases the adoption of beneficial practices (Shaw, Luebell, and Ohmart 2011).

Although either securely neutral or enhancing in all three age groups, it does appear that the factor *flow of information from customers* may become more enhancing as a winery is in business longer. These wineries may have developed more consistent lines of communication due to the length their relationships with regular customers. Similarly it appears that the wineries with 10+ years of business have a more favorable impression of substitute products such as micro-brews. This could be attributed to production of such products within these wineries themselves.

The factors in the government support and policies section were overwhelmingly constraining. The most constraining factors across all clusters were *confidence/trust in state political systems, tax system,* and *administrative/bureaucratic regulations.* These are areas of high concern as governments can provide funding through grants, tax breaks, and regulatory mechanisms. If this is not the case, growth and development in wine quality can be difficult. This was identified as the key area of strategic emphasis in the growth of the South African wine industry (Van Rooyen, Esterhuizen, and Stroebel 2011).

Some factors of note in (Table 4d, Appendix C) include differences between the WM and NWM clusters especially as it applies to the factors *confidence/trust in local political systems* and *competence of personnel in public sector*. Those who are winemakers found the factor *confidence/trust in local political systems* to be constraining whereas those who are not the winemaker found this factor to be securely neutral. Also, those who are winemakers found the factor *Competence of Personnel in Public Sector* to be highly constraining whereas their counterparts of owners who are not the winemakers found this factor to be neutral. This indicates that government regulations are currently much more restrictive regarding winemaking than grape growing in the U.S.

A final note of comparison in the government support and policies section analyzed wineries that have been open for 1-5 years, 1-6 years and those with 10 + years in business. All three clusters in this section found zero factors of enhancing qualities. It may appear that confidence and opinion on all factors related to the government is constraining and increases with number of years in business. Government factors are found to be constraining factors in

many other regions of the wine world, particularly tax systems and the competence of public personnel (Van Rooyen, Esterhuizen, and Stroebel 2011).

The demand condition factors (Table 3) were varied yet showed a very high presence of neutrals and enhancing ratings. The factors with the most enhancing effects across all clusters include *regional tourism increase, growth in the United States wine market,* and *consumer knowledge of local products*. Some of the more constraining effects across all clusters include *growth in local market* and *competition in local market.* This is encouraging as enhancing demand conditions can often offset the constraining conditions within the previous sections. Furthermore the reputation of wine region can built locally and through tourism efforts, and consumers are more willing to pay more for wines that use an AVA designation they are familiar with (Cross, Plantinga, and Stavins 2011). Additionally consumers of Shawnee Hills wines are knowledgeable which is important as consumer perceptions can be directly linked to the presence of regulatory features such as the presence of regional quality wine program noted on a label (Chiodo, Casolani, and Fantini).

Wineries with solo owners found *consumer demand for Vinifera wines* and *demand for products in metropolitan Areas* to be constraining whereas those with multiple owners found these factors to be securely neutral (Table 4e Appendix C).

A final note of comparison regarding demand conditions will be conducted on wineries that have been open for 1-5 years and those with 10 + years in business. Wineries with 1-5 years of business found the factors *growth in local market* and *local market size* (Table 4e) to be constraining whereas those with 10+ years of business found these to be neutral. Furthermore

wineries with 1-5 years of business found the factors *consumer demand for Vinifera wines* and *demand for products in metropolitan areas* to be neutral whereas those with 10+ years of business found these same factors to be constraining. This is interesting as it shows a conflicting view of consumer demand between younger and older wineries. The wineries with 1-5 years of business appear to be more concerned about consumer demand locally whereas those with 10+ years of business appear to be more concerned with consumer demand outside of the local market.

CHAPTER 5

CONCLUSION & RECOMMENDATIONS

After completing the study of the Lodi and Central Coast AVAs in California, two things are clear. The presence and recognition of an area's possession of a distinct geography as referenced by an American Viticultural Area distinction has a significant effect on price. However, the implementation of regional quality winemaking and grape growing standards, e.g., the Lodi Rules Sustainable Winegrowing Program and SIP Certification Program, was even more important. Other AVAs may therefore conclude that they should take matters into their own hands by developing regional quality wine quality programs, which decreases the uncertainty in consumer wine purchases. Our research does not study direct costs and benefits to the Shawnee Hills AVA, yet such knowledge is of great importance and worthy of future research. How much profit can be gained for both growers and winemakers if a quality program is implemented? Also how much will this program cost to implement? Such an investigation may be useful because growers, heavily influenced by economic factors, may need to be shown the potential impact of a quality wine standards program in a cost/benefit format. Additionally it is known that regional reputation and knowledge regarding quality production are key drivers of consumer demand (Foti, Pilato, and Timpanaro 2011), but outside of those factors it is not known what currently are the key drivers behind the demand of Shawnee Hills wines. This information would be of great value to the creation of a regional wine quality program. An expanded and regularly administered Shawnee Hills AVA Winery Competiveness Survey may ease much of these uncertainties.

Furthermore the results of the wine competiveness survey indicate a need to differentiate Shawnee Hill's wines from both neighboring wine regions in the short run and global wines in the long run in order to penetrate the profit maximizing regional metropolitan markets such as Chicago, IL, St. Louis, MO, Nashville, TN and others. While a regional or AVA specific wine quality program has shown to help accomplish this task in other regions, the survey results also portrayed a current lack of essential financial support necessary to implement such a quality assurance program. Government support both locally and statewide must be sought out. Governments must be convinced that its investment will improve the economic situation; with the current negative economic conditions, now may be the time.

However, in order to convince government agencies to invest in programs to improve quality, a collective activism must be achieved. Community partnerships are essential to the development of any regional quality program. If community cohesiveness can be improved then chances of government support should improve as well. In the Lodi AVA newsletters and grassroots coffee shop meetings were utilized to partly achieve this goal (Shaw, Luebell, and Ohmart). Whereas in South Africa, “lobby discussions” were conducted which brought governments and industry leaders together (Van Rooyen, Esterhuizen, and Stroebel 2011). Finally, collaboration with research institutions must be improved. While both private enterprises and public research institutions may have similar goals, they may not be able to agree on the path to achievement of these goals simply because there is a lack of consistent lines of communication. Such collaborative efforts have shown to be successful in regulation formation and funding procurement in regions such as Lodi, CA, Iowa, Ohio, and countless others. A more united effort could only benefit the Shawnee Hills AVA.

There are, however, some positive factors already at work here in the Shawnee Hills AVA as shown by the survey results. The Shawnee Hills AVA is filled with winery owner/operators who believe in the enhancing qualities of innovation and unique processes. Wine quality assurance programs are such entities. Furthermore it appears that the supply of local grapes is in no immediate danger of a shortage. This is important because most regional wine quality programs require the use of AVA grown fruit. Perhaps most intriguing, overall consumer demand in the United States for wine, specifically regionally identifiable wine with a sense of place is growing tremendously. With a united focus on product differentiation, the Shawnee Hills American Viticultural Area has a chance to capture a portion of that growth.

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APPENDICES

Appendix A: Descriptive Statistics (NASS 2012).

Figure A: Lodi AVA Descriptive Statistics

Lodi 1976-2011	***Total Crushed (Production Tons)***	***Weighted Average Price ($ Per Ton)***
Mean	**335,942.70**	**$374.86**
Standard Deviation	**340,907.28**	**$287.79**
Variance	**1.162178E+11**	**$82,824.5**

Figure B: Central Coast AVA Descriptive Statistics

Central Coast 1976-2011	***Total Crushed (Production Tons)***	***Weighted Average Price ($ Per Ton)***
Mean	**264,262.86**	**$826.01**
Standard Deviation	**133,575.37**	**$331.18**
Variance	**17,842,378,539**	**$109,683.48**

Appendix B: Winery Competiveness Survey Instrument for Owner/Operators in the Shawnee Hills AVA Conducted January 2013-February 2013

Figure C.1: Survey of Production Factor Conditions

I. Production Factor Conditions	Mostly Constraining	Modestly Constraining	Neutral	Modestly Enhancing	Mostly Enhancing
Quality of low-level skilled labor					
Cost of Transport					
Cost of Financing					
Availability of skilled labor					
Overall Cost of doing business					
Labor Administrative Cost					
Cost of Quality Technology					
Quality of Skilled Labor					
Cost of Skilled Labor					
Cost of Infrastructure					
Credit Availability					
Availability of Quality Technology					
Quality of Technology					
Availability of Water for industrial purposes					
Availability of low level skilled labor					

Figure C.2: Survey of Related & Supporting Industries

II. **Related and Supporting Industries**	**Mostly Constraining**	**Modestly Constraining**	**Neutral**	**Modestly Enhancing**	**Mostly Enhancing**
Electricity Supply					
Collaboration with research institutions in R&D					
Telecommunication					
Suppliers of packaging material					
Financial Institutions					
Transportation Companies					
Internet Service Providers					
Social Media Services					
Long-term Outlook of local grape suppliers					
Reputation of research institutions					
Quality of local grape suppliers					

Figure C.3: Survey of Firm, Strategy, Structure, & Rivalry

III. Firm, Strategy, Structure, Rivalry	**Mostly Constraining**	**Modestly Constraining**	**Neutral**	**Modestly Enhancing**	**Mostly Enhancing**
Expenditure on R&D in winery					
Expenditure on R&D in vineyard					
Incentives for Management					
Flow of information from customers					
Information flow from primary suppliers to company					
Substitutes of company's products or services (i.e. microbrews)					
Continuous Innovation					
AVA Regulatory Standards					
Efficiency of Technology in production process					
Investment in Staff (training)					
Unique Services and Processes					
Entry of New Competitors					
Neighboring wine region product entry in local market					
Affordable high quality products					
Regional industry structure &					

rivalry					

Figure C.4: Survey of Government Support & Policies

IV. Government Support & Policies	Mostly Constraining	Modestly Constraining	Neutral	Modestly Enhancing	Mostly Enhancing
Confidence/Trust in local political systems					
Confidence/Trust in State political system					
Competence of Personnel in Public Sector					
Labor Policy & Regulation					
Administrative/ Bureaucratic Regulations in Industry					
Land use regulation policies					
Employee hiring/firing policies					
Tax System					
Political Changes					
Environmental Regulations					
Distribution policies					
Federal Government Wine/grape policy					

Complying with Environmental Standards					

Figure C.5: Survey of Demand Conditions

V. Demand Conditions	Mostly Constraining	Modestly Constraining	Neutral	Modestly Enhancing	Mostly Enhancing
Growth in Local Market					
Local Market Size					
Competition in Local Market					
Demand for Environmental Friendly Products					
Regional Tourism Increase					
Growth in United States Wine Market					
Consumer knowledge of local products					
Sophistication of local buyers					
Consumer Demand for Vinifera Wines					
Demand for products in metropolitan areas					

Appendix C: Shawnee Hills AVA Winery Competiveness Survey 2013

Table 4a: Shawnee Hills Winery Competiveness Survey 2013 Production Factor Results

PRODUCTION FACTORS	Overall	SOLO	MULTI	WM	NWM	1- 5	6 - 10	10 +
Quality of low-level skilled labor	2.9	3.1	2.7	2.8	3.3	2.8	3.1	2.8
Cost of Transport	2.3	2.5	2.0	2.3	2.3	2.5	2.4	1.8
Cost of Financing	2.4	2.4	2.5	2.5	2.0	2.8	2.1	2.3
Availability of skilled labor	2.6	2.7	2.5	2.4	3.5	1.8	3.1	3.0
Overall Cost of doing business	1.9	2.1	1.7	1.9	2.0	1.8	2.3	1.5
Labor Administrative Cost	2.6	2.5	2.7	2.5	2.8	2.8	2.7	2.0
Cost of Quality Technology	2.5	2.5	2.5	2.4	2.8	2.5	2.3	3.0
Quality of Skilled Labor	2.8	2.8	2.8	2.5	4.0	2.5	3.4	2.3
Cost of Skilled Labor	2.5	2.4	2.8	2.3	3.0	2.3	2.7	2.5
Cost of Infrastructure	2.2	2.3	2.2	2.0	3.0	1.8	2.4	2.5
Credit Availability	2.6	2.5	3.0	2.6	2.8	2.5	2.9	2.5
Availability of Quality Technology	3.1	2.8	3.7	3.1	3.3	2.8	3.6	2.8
Quality of Technology	3.4	3.0	4.0	3.3	3.5	3.3	3.6	3.0
Availability of Water for industrial purposes	3.2	2.8	3.8	2.9	4.0	3.2	3.3	3.0
Availability of low level skilled labor	2.6	2.6	2.7	2.4	3.5	2.3	3.1	2.3

***Ratings:** 1= mostly constraining; 2 = mildly constraining; 3 = neutral; 4 = mildly enhancing; 5 = mostly enhancing

***Legend:** All respondents = Overall; Solo owner = SOLO; Multiple Owners = MULTI; Owner performs winemaking tasks = WM; Owner hires labor to perform winemaking tasks = NWM; Number of years in business = 1-5, 6-10, 10+

***Sample size =** 17 total respondents

Table 4b: Shawnee Hills Winery Competiveness Survey 2013 Related & Supporting Industries Results

RELATED & SUPPORTING INDUSTRIES	OVERALL	SOLO	MULTI	WM	NWM	1 - 5	6 - 10	10 +
Electricity Supply	3.3	3.1	3.7	3.5	2.8	4.0	3.0	2.8
Collaboration with research institutions in R&D	3.1	3.0	3.2	2.9	3.5	2.8	3.3	3.0
Telecommunication	2.9	2.7	3.2	3.1	2.3	2.8	2.7	3.3
Suppliers of packaging material	3.3	3.3	3.3	3.3	3.3	3.0	3.3	3.8
Financial Institutions	3.2	3.2	3.2	3.2	3.0	3.3	3.1	3.0
Transportation Companies	3.1	3.2	2.8	3.0	3.3	3.0	3.1	3.0
Internet Service Providers	3.1	2.6	3.8	3.1	3.0	3.0	3.1	3.0
Social Media Services	3.3	2.9	4.0	3.2	3.8	3.0	3.0	4.3
Long-term Outlook of local grape suppliers	2.8	2.5	3.5	2.7	3.3	2.5	2.9	3.3
Reputation of research institutions	3.0	3.3	2.5	2.8	3.5	2.3	3.3	3.5
Quality of local grape suppliers	3.4	3.5	3.0	3.3	3.5	3.0	4.0	2.8

***Ratings:** 1= mostly constraining; 2 = mildly constraining; 3 = neutral; 4 = mildly enhancing; 5 = mostly enhancing

***Legend:** All respondents = Overall; Solo owner = SOLO; Multiple Owners = MULTI; Owner performs winemaking tasks = WM; Owner hires labor to perform winemaking tasks = NWM; Number of years in business = 1-5, 6-10, 10+

***Sample size =** 17 total respondents

Table 4c: Shawnee Hills Winery Competiveness Survey 2013 Firm Strategy, Structure, & Rivalry Results

FIRM STRATEGY, STRUCTURE, & RIVALRY	OVERALL	SOLO	MULTI	WM	NWM	1 - 5	6 - 10	10 +
Expenditure on R&D in winery	2.7	2.7	2.7	2.8	2.3	2.5	2.7	3.0
Expenditure on R&D in vineyard	2.9	2.9	2.8	3.1	2.3	3.0	2.7	3.0
Incentives for Management	2.8	2.6	3.2	2.8	2.8	2.8	2.7	3.0
Flow of information from customers	3.6	3.5	3.8	3.5	3.8	3.5	3.3	4.3
Information flow from primary suppliers to company	3.4	3.5	3.2	3.4	3.5	3.3	3.3	3.8
Substitutes of company's products or services (i.e. microbrews)	3.4	3.4	3.3	3.3	3.5	3.2	3.1	4.0
Continuous Innovation	3.7	3.5	4.0	3.6	4.0	4.0	3.4	3.8
AVA Regulatory Standards	3.1	3.2	3.0	3.1	3.3	3.0	3.2	3.3
Efficiency of Technology in production process	2.9	2.8	3.2	3.0	2.8	2.7	3.1	3.0
Investment in Staff	3.4	3.2	3.8	3.5	3.3	3.3	3.4	3.5
Unique Services and Processes	3.6	3.5	3.8	3.5	4.0	3.5	3.4	4.3
Entry of New Competitors	2.6	2.8	2.3	2.7	2.3	3.0	2.5	2.3
Neighboring wine region product entry in local market	2.6	2.5	3.0	2.5	3.0	2.7	2.7	2.5
Affordable high quality products	2.9	2.5	3.7	2.7	3.8	3.0	2.9	3.0
Regional industry structure & rivalry	2.8	2.7	3.0	2.7	3.0	2.3	3.1	3.0

***Ratings:** 1= mostly constraining; 2 = mildly constraining; 3 = neutral; 4 = mildly enhancing; 5 = mostly enhancing

***Legend:** All respondents = Overall; Solo owner = SOLO; Multiple Owners = MULTI; Owner performs winemaking tasks = WM; Owner hires labor to perform winemaking tasks = NWM; Number of years in business = 1-5, 6-10, 10+

***Sample size =** 17 total respondents

Table 4d: Shawnee Hills Winery Competiveness Survey 2013 Government Support & Policies Results

GOVERNMENT SUPPORT & POLICIES	OVERALL	SOLO	MULTI	WM	NWM	1 - 5	6 - 10	10 +
Confidence/Trust in local political systems	2.6	2.5	2.8	2.3	3.5	2.7	2.9	2.0
Confidence/Trust in State political system	1.5	1.4	1.7	1.3	2.0	1.3	1.6	1.5
Competence of Personnel in Public Sector	1.9	1.9	1.8	1.5	3.0	1.7	2.0	2.0
Labor Policy & Regulation	2.3	2.4	2.2	2.2	2.5	2.3	2.6	1.8
Administrative/Bureaucratic Regulations	1.8	2.0	1.5	1.7	2.3	1.8	1.9	1.8
Land use regulation policies	2.9	2.9	2.8	2.8	3.0	3.0	3.1	2.3
Employee hiring/firing policies	3.2	3.3	3.2	3.2	3.3	3.2	3.1	3.5
Tax System	1.6	1.7	1.5	1.6	1.8	1.5	1.9	1.5
Political Changes	1.9	1.9	2.0	2.0	1.8	2.0	2.0	1.8
Environmental Regulations	2.5	2.7	2.2	2.5	2.5	2.7	2.4	2.5
Distribution policies	2.2	2.2	2.3	2.5	1.5	2.7	2.0	2.0
Federal Government Wine/grape policy	2.6	2.6	2.5	2.6	2.5	3.0	2.4	2.3
Complying with Environmental Standards	2.8	2.8	2.8	2.8	3.0	2.7	2.9	3.0

***Ratings:** 1= mostly constraining; 2 = mildly constraining; 3 = neutral; 4 = mildly enhancing; 5 = mostly enhancing

***Legend:** All respondents = Overall; Solo owner = SOLO; Multiple Owners = MULTI; Owner performs winemaking tasks = WM; Owner hires labor to perform winemaking tasks = NWM; Number of years in business = 1-5, 6-10, 10+

***Sample size =** 17 total respondents

Table 4e: Shawnee Hills Winery Competiveness Survey 2013 Demand Conditions Results

DEMAND CONDITIONS	OVERALL	SOLO	MULTI	WM	NWM	1 - 5	6 - 10	10 +
Growth in Local Market	2.8	2.6	3.2	2.8	2.8	2.8	2.6	3.3
Local Market Size	2.9	2.6	3.3	2.8	3.0	2.7	2.7	3.5
Competition in Local Market	2.8	2.6	3.0	2.7	3.0	3.0	2.6	2.8
Demand for Environmental Friendly Products	3.1	3.3	2.8	3.1	3.3	2.8	3.1	3.5
Regional Tourism Increase	4.0	3.7	4.5	3.8	4.8	4.3	3.9	3.8
Growth in United States Wine Market	3.7	3.5	4.0	3.7	3.8	3.7	3.4	4.3
Consumer knowledge of local products	3.4	3.0	4.0	3.3	3.5	3.7	2.9	3.8
Sophistication of local buyers	3.0	2.9	3.2	2.9	3.3	3.2	2.9	3.0
Consumer Demand for Vinifera Wines	2.9	2.5	3.5	2.8	3.0	3.3	2.6	2.8
Demand for products in metropolitan areas	2.9	2.5	3.7	3.0	2.8	3.5	2.6	2.5

***Ratings:** 1= mostly constraining; 2 = mildly constraining; 3 = neutral; 4 = mildly enhancing; 5 = mostly enhancing

***Legend:** All respondents = Overall; Solo owner = SOLO; Multiple Owners = MULTI; Owner performs winemaking tasks = WM; Owner hires labor to perform winemaking tasks = NWM; Number of years in business = 1-5, 6-10, 10+

***Sample size =** 17 total respondents

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