

MASTER OF WINE DISSERTATION

Counterfeit Wine – Its Impact on the Business of Wine

Candidate # 19/08

March 2010

Word Count: 9989

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Summary

The purpose of this dissertation is to explore the issue of counterfeit wine and how it impacts the business of wine. The study seeks to explore how serious the issue of counterfeit wine is believed to be, how it is impacting the wine business now as well as concerns for the future. It also looks into what actions are being taken by producers and consumers, attitudes towards counterfeit wine and techniques being used to combat wine fraud.

The research is important to the wine industry for two main reasons - the current market environment of high wine prices and limited supply making wine increasingly attractive to counterfeiters and the very limited amount of existing research and literature on how counterfeit wine impacts the wine business.

The research involved a review of existing literature as well as original research involving producers, consumers, those involved in the wine trade¹, enforcement bodies and anti-fraud companies. Original research consisted of questionnaires with producers and consumers and interviews with the wine trade, enforcement bodies and anti-fraud companies.

A limitation of this study is that, being illegal, counterfeit wine is a controversial topic and some parties may have been reluctant to openly discuss it. However, the original findings of this research can significantly help the wine industry to form plans as to how to deal with the issue of counterfeit wine in the future.

¹ The term ‘trade’ is used throughout this paper and refers to auction houses, merchants and retailers

Introduction

Counterfeit wine is becoming an increasingly topical issue in the wine business. The limited amount of fine wine in the world is now subject to increased demand due to new wealthy collectors in emerging markets, excellent recent vintages and diminishing supply of older vintages. These and other factors are driving up prices and creating an environment of limited supply and high value that may make fine wine attractive for counterfeiting.

This dissertation explores the impact that counterfeit wine has on the business of wine and how serious the issue of wine fraud is believed to be amongst producers. The hypothesis is that the current market environment should cause concern amongst producers of fine wine that they may be targeted by counterfeiters and that their business may be negatively impacted.

There is much speculation surrounding the issue of counterfeit wine but also a growing body of literature with examples of evidence. Further evidence of counterfeiting comes from industry experts and those in the trade who claim to have rejected lots destined for sale or personally seen counterfeit bottles in cellars or retailers. Being an illegal activity, and with little existing literature on the size of the problem, there is difficulty in determining the exact size of the counterfeit wine market. With the ‘fine wine market’ estimated at USD\$3 billion by director of Liv-ex, James Miles, even a small percentage that may be counterfeit is significant in the impact that it could have on the global wine business. Combined with estimates from the wine trade that counterfeiting comprises between 0.2-1%, this study estimates the counterfeit wine market at between USD\$6 million and USD\$30 million.

While the literature proves that counterfeit wine exists, the need for this research is evidenced by the lack of scientific information on how counterfeit wine may be impacting the business of wine both now and in the future. This paper is relevant in that it provides both an estimate of the size of the counterfeit wine market and fulfils the need of the industry to better understand the extent to which counterfeit wine is impacting the business of wine.

This research is not meant to in any way identify how counterfeiting of wine is done, who is responsible or any suspicious businesses linked with the counterfeiting of wine. This research can fulfill an important function in that it obtains current attitudes amongst producers, the trade and consumers as to the impact that counterfeiting of wine is having on their business from a financial, brand and public perception

standpoint. It also brings together perceptions on where counterfeiting of wine might be heading in the future and what might be done to prevent it.

The Counterfeit Wine Problem

This initial section focuses on the problem of counterfeit wine. It shows why wine might be attractive to counterfeiters, provides evidence that counterfeiting in the fine wine market exists, and provides an estimate on the size of the counterfeit wine market.

The Attraction of Wine to Counterfeiters

The confluence of many current events has created a situation where wine may be very attractive to counterfeiters. The more attractive wine is to counterfeiters, the more it can be assumed that producers might be targeted. Spivak (2008) sums up the potential for the increasing incidence of fraud: ‘Fueled by some spectacular recent vintages, such as the 2000 and 2005 Bordeaux, the market for rare and prized wines has become superheated, encouraging counterfeiters’. This is supported by Sokolin (2008) - prices for fine wine are largely spiraling upward due to both limited supply, diminishing supply of older vintages (other than fakes) and the increasing wealth in the world creating more potential buyers. All of these events create a significant opportunity to make money for counterfeiters. The recent downturn in the world economy could have dampened the attraction to counterfeiters but the Liv-ex 100 data showed the market was already reviving in early 2010 (Liv-ex, 2010).

Another important reason why wine is attractive for counterfeiting is the difficulty in proving provenance of older bottles. The older the vintage, the more difficult it is to prove or disprove authenticity. Hellman (2009) refers to poor record keeping of what was bottled by châteaux, domaines, retailers and negociants. This combined with the fact that wine travels vast distances and changes hands frequently and that there are no records of what has been consumed make it extremely difficult to determine how much of a particular wine should still be in circulation.

In the case of old wines, they will also be variable in taste and new buyers may not be knowledgeable about what to expect in regards to what these wines should taste like. Spivak (2008) points out ‘given bottle variation and different storage conditions, it's not hard to fool people.’ Caillard MW (2009) also underlines this point: ‘The power of the imagination is able to transcend “over the hill” bottles into soaring examples of elegance and sophistication.’ This benefits counterfeiters by making it less important to accurately mimic the taste of a wine they are counterfeiting as many consumers may not know what these rare wines should taste like.

Evidence that Counterfeit Wine Exists

A study of existing literature has established that counterfeit wine exists. While much of the published literature on counterfeit wine is speculation, the recent increased publicity on the subject has produced a large body of evidence that counterfeiting exists on a number of different levels. Specifically, there is growing evidence of counterfeiting of fine wine, the focus of this research.

There are numerous reported cases of counterfeit fine wine over recent years. Some of the more famous cases include 1990 Penfolds Grange, 1994 and 1995 Sassicaia worth over £1 million and fake Rioja estimated at one million bottles (Nickel & Sang Jr., 2008). Collector William Koch, who is embroiled in large scale lawsuits over counterfeit wine, claims to own magnums of 1921 Château Pétrus filled with cheap California Cabernet. Pétrus representatives state that the Château never bottled any magnums of the 1921 (Spivak, 2008). Koch estimates having spent USD\$4 million on wine that turned out to be fake (Sun Sentinel, 2009).

Burgundy winemaker Laurent Ponsot discovered that 106 out of 107 bottles of his wine at auction were fakes including ‘a sale of Clos Saint Denis 1945 and other old vintages when we didn't even begin producing this particular appellation until 1982,’ (Schroeder, 2009). One collector had 1947 Domaine de la Romanée-Conti in his cellar, another example of a vintage that was never produced (Wallace, 2008). When asked in an interview with Wine Spectator if Sotheby's is seeing more fakes, Serena Sutcliffe MW, Head of Sotheby's International Wine Department responds: ‘Yes. [The numbers are] very, very high’ (Suckling 2009).

Further evidence of fine wine counterfeiting is sighted in Canadian Press (2004) claiming over two-thirds of Canadian icewine sold in Asia is fake. Another example of counterfeiting is reported by Parzen (2009) with the supposed adulteration of 6.7 million litres of Brunello di Montalcino. The Alliance Against Counterfeiting & Piracy (2009) reports another example with the faking of 1500 bottles of Champagne by bottling low quality, sweet and cheap wine as Moët & Chandon. In another case involving Champagne, 300,000 bottles of cheap sparkling wine were bottled as Champagne, some of which was sold in the United Kingdom (Samuel, 2009). Further examples are mentioned in Parra, et al. (2006), Stewart (2007), Fortado (2009) and Weed (2009). There is also a reported increase in the trading of empty bottles over the internet with the suggestion that they are refilled to make counterfeit wine (Goldstein, 2009; Schamel, 2009). In addition, more cases are making it to the courts and getting the attention of enforcement bodies

(Wilke, 2007). All of this evidence points to the existence of counterfeit wine in the fine wine market. The evidence then raises the question as to what portion of the fine wine market is counterfeit.

The Size of the Counterfeit Wine Market

Estimating the size of the counterfeit wine market is very difficult and because it is an illegal activity there will always be a degree of speculation. The few estimates on the incidence of counterfeit wine that were found in existing literature did not seem to be backed with any scientific evidence.

The first challenge is accurately determining the size of the overall fine wine market as there are different definitions of what it should include. For the purpose of this dissertation the fine wine market was defined in the synopsis as wines of limited availability and high demand. James Miles, director of Liv-ex, who track sales of fine wine through merchants and auction houses estimates the fine wine market is worth USD\$3 billion. Liv-ex uses a similar definition of ‘fine wine’ as that set out in the synopsis (Miles, 2009). Interviews with the wine trade produced estimates of between USD\$500 million and USD\$5 billion, reflecting different definitions of the size of the fine wine market.

Estimating the percentage of wines that are counterfeit is more difficult. None of the literature studied produced an estimate with sound scientific backing. Frank (2007) in an article for Wine Spectator estimated 5% of the rare wines sold on the secondary markets are counterfeit. Interviews with the wine trade produced lower estimates of counterfeiting. These trade estimates have more scientific basis as they were calculated based on the actual percentage of wines they are offered but refuse to sell due to suspicion of counterfeiting. Estimates ranged from 0.2-1%. Producers and consumers were also asked to estimate the incidence of counterfeiting with producer responses averaging 4.2% and consumers 4%.

Using the broad estimates, the counterfeit market could be worth anywhere between USD\$1 million and USD\$250 million. However, using a more sound Liv-ex estimate of a USD\$3 billion fine wine market and trade estimates of 0.2-1% counterfeit wines, the counterfeit wine market is worth between USD\$6 million and USD\$30 million.

The following table shows the different potential sizes of the counterfeit wine market based on these estimates.

Table 1 - Estimated size of the counterfeit wine market

% Counterfeit Wine	Size of the Counterfeit Wine Market based on Different Total Market Sizes (USD)			
	\$500 million	\$1 billion	\$3 billion	\$5 billion
0.2%	\$1,000,000	\$2,000,000	\$6,000,000	\$10,000,000
0.5%	\$2,500,000	\$5,000,000	\$15,000,000	\$25,000,000
1.0%	\$5,000,000	\$10,000,000	\$30,000,000	\$50,000,000
4.0%	\$20,000,000	\$40,000,000	\$120,000,000	\$200,000,000
5.0%	\$25,000,000	\$50,000,000	\$150,000,000	\$250,000,000

Other industries have developed more organized estimates of the size of the counterfeit market for their products. The spirits industry has studied the issue in depth and developed a number of estimates on the size of the counterfeit problem (Pira International, 2009). No such studies or estimates appear to have been completed for the wine industry.

Literature Review & Background Research

On assessing the large amount of existing literature on counterfeit wine, it was found that there is very little that illustrates the impact on the business of wine. The lack of scientific information highlights the importance of this research to provide new findings, insights and analysis on the subject.

How is Counterfeit Wine Impacting the Wine Business?

Potentially all sectors of the wine business could be impacted by counterfeit wine but the key parties include producers, consumers, those selling fine wine, anti-fraud technology producers and enforcement bodies. Each of these groups is potentially affected by counterfeit wine in different ways and it is a goal of this research to determine how they are impacted. The areas identified with the greatest potential impact on the wine industry include financial loss, damage to brand reputation and liability.

Nickel & Sang Jr. (2008), in a report for the Hewlett Packard Company, point out a number of areas of potential impact: ‘counterfeiting reduces revenues for the authentic producers and distributors, lowers the brand quality in the eyes of the consumer and exposes the producer to liability risks. There are also ancillary costs associated with fraud prevention, audits and investigation, time spent with regulators and customs, pressure from legitimate distributors and increased customer service costs’. They go on to add: ‘working with regulators, participating in industry efforts, doing investigations, legal and fraud consultation, and educational efforts’ as further associated costs.

Financial Impact

Vithlani (1998) outlines potential costs of counterfeiting including loss of sales, loss of goodwill, expenditure in protecting and enforcing property rights, expenditure on investigating and enforcement operations, lost direct investment in countries where counterfeiting is rife, job losses, loss of foreign exchange, lost tax revenues, and additional judicial costs. All of these could have a significant impact on the wine industry.

A producer is likely to experience direct and measurable financial costs from counterfeiting including the cost of anti-fraud technology, ranging from ‘pennies per bottle to USD\$16 per bottle’ (Weed, 2009) and any wages associated with monitoring for counterfeit wine. Lost sales are potentially significant for a producer but more difficult to determine. Only those who have actually discovered counterfeits can have

any real estimate of the financial loss. Because of this, for many producers loss of sales is not considered to be an issue. Francis Mayeur, director of Château d'Yquem has stated: 'But fakes do not concern the château, they concern exchanges between collectors,' (Agence France Presse, 2006).

Canadian icewine is one product whose business has been severely impacted by fraud. Canadian Anti-Counterfeiting Network (2007) reports 'Canadian icewine producers estimate that legitimate sales have dropped by more than 50 percent in some markets because of counterfeits'. Vineland Estates had built up \$250,000 worth of icewine sales to China which reduced to just 5% of that number in five years (Coffey, 2006).

Consumer anxiety over potentially fraudulent wines may also impact sales at all levels of the wine market, particularly for the high value wines targeted by counterfeiters. The entire thread of 'WS [Wine Spectator] article on fake Ponsot lot..' on erobertparker.com brings up many issues regarding the attitudes towards fraud amongst consumers. Many of the writers on this thread state that due to fraud they no longer feel comfortable dealing in some of the old wines (Meadows, 2008). Quoted in Frank (2007), Rob Rosania, a major New York collector, states: 'People are anxious about fraud.'

The high legal costs of both an investigation and defence against fraud could financially impact all levels of the industry from consumers through to re-sellers of fine wine. In Schroeder (2009), Laurent Ponsot gives the producer point of view: 'There are no funds. Each lawsuit costs 500,000 euros.' It may be that only larger businesses have the financial means to contest. Collector William Koch is variously quoted as already having spent USD\$5 million (Hellman, 2009) or USD\$7 million (Sun Sentinel, 2009) investigating and suing over counterfeit wine. Hellman (2009) reports a number of ongoing legal cases over counterfeit wine that are stalled in the courts and likely incurring significant legal fees. Producers, it seems, are less likely to be implicated in legal cases on secondary sales as most transactions occur between collectors, merchants or auction houses and vendors.

There may also be a financial impact on areas indirectly related to counterfeiting. Wright (2006) states 'we must recognize the enormous cost posed by counterfeiting and piracy—not just in terms of lost revenues to the business sectors involved, but in terms of lost jobs, lost wages, lost taxes, and lost growth for the future.'

Brand / Reputation Impact

The reputation of a producer or seller of wine is very important for growth, the ability to be trusted and for generating sales in the future. Logically, being associated with counterfeit wine could have a negative impact on the reputation of a business. Quoted in Weed (2009), Ursula Hermacinski, estate director at cult winery Screaming Eagle states, “The largest issue [with counterfeit wine] is any kind of brand erosion.” Haut Brion director, Jean Philippe Delmas, suggests that while many producers hadn’t taken counterfeit wine seriously, attitudes might now be changing and that as prices rose significantly in the mid-90s they [producers] have been much more cautious (Agence France Presse, 2006).

One of the major issues associated with counterfeit wine is the mixed views as to whether it should be discussed publicly or dealt with quietly, avoiding an impact on brand by creating unnecessary anxiety amongst customers. Producers and the trade seem to have mixed views on the topic. Schroeder (2009) points out the concern that some producers have over going public: “There are also those vintners who prefer to avoid any publicity regarding fake wine. “They file a complaint, but always quietly,” said the French wine expert Claude Maratier. “They are too afraid that their entire production will be put in doubt.”” Others would like to make the issue more public. Robinson (2007) reflects the industry’s mixed views saying: ‘[Sutcliffe MW] has been one of the few to go willingly on the record on this issue.’ In an article in Agence France Presse (2006), David Molyneux Berry, an expert on older fine and rare wine, mentions the tendency for wineries to keep quiet about fakes. Conversely, a number of other experts quoted in the same article believe that group action and legal action is necessary to make any difference. The industry is clearly divided on the issue.

Auction houses and merchants are at the centre of the counterfeiting issue as many fine wines trade through their medium. This results in the trade being held responsible for provenance and puts their reputation at stake, potentially impacting their business. Wilke (2007) states that it is under the auction houses’ names that there is the most potential for fraudulent bottles to change hands. Meadows (2009, pers comm.) comments that ‘Auction houses have necessarily had to become more active in their pronouncements about combating the problem while at the same time denying that it’s a big problem.’ Each lot offered to those trading fine wine will necessitate a difficult decision balancing the need for revenue and profits versus potential impacts on a firm’s reputation.

Liability Impact

Another area where counterfeiting may impact a business is liability. This largely impacts those dealing on the secondary wine market as this is where the most targeted wines appear to change hands. Auction houses, merchants and retailers can potentially be held accountable for fraudulent wines they sell even if they are not aware that they are counterfeit. A particular example of this is one law suit against an auction house and retailer that never even alleges there was knowledge that some of the wines sold were fraudulent but holds them responsible for selling the wine nonetheless (Wilke, 2007). Another example is William Koch who continues to seek damages saying ‘auction houses either knowingly or negligently sold fakes’ (Hellman, 2009).

Rich collectors may have the financial resources to seek convictions and create change in how fine wine is bought and sold. Quoted in Frank (2007), Koch states: “I plan to force the auction houses and retailers to make serious changes.” Some changes have already had results: ‘A court order has stopped one auction house from selling wine pre-1962 in New York’ (Caillard MW, 2009). The legal costs associated with fighting liability cases could have significant financial impact on the industry. This risk should encourage increased due diligence from all parties involved and may lead to the adoption of some techniques to help prevent counterfeiting.

Other Impacts

While the biggest impact of counterfeit wine appears to be on producers, consumers and particularly the wine trade, there is also an impact on anti-fraud technology producers and enforcement bodies. There are a number of products being offered to the wine industry (see Appendix page 63) to assist with fraud prevention. If these products are successful in establishing market share there will be a positive financial impact for anti-fraud companies. However, this will come with an increased cost to producers that would likely be passed on to consumers.

In regards to enforcement bodies, an increase in the number of counterfeit wine cases will result in more resources having to be allocated to the issue. This is evidenced by cases such as the FBI involvement with the ongoing Ponsot case of counterfeit wine found for sale at auction (Ponsot 2009, pers comm.).

Prevention of Counterfeiting – Enforcement

Background research was conducted to determine to what extent initiatives are being undertaken to prevent or combat counterfeiting of wine. While many enforcement agencies have been involved in cases of wine fraud, none of those contacted reported having specific resources devoted to preventing counterfeit wine but rather just deal with incidences on a case by case basis. Any cases that exist are focused on the criminal offence, such as conspiracy to defraud, rather than the product itself.

The following organizations were contacted as part of the background research. In the UK: Serious Fraud Office; Department for Business, Innovation and Skills; UK Office of Fair Trade; investdrinks.org and the Food Standards Board. In the USA: Federal Bureau of Investigation (FBI); US Federal Trade Commission; US Justice Department and the US Attorney General's Office. In Europe: Service de la Repression des Fraudes; Federation des Exportateurs de Vins et Spiritueux de France (FEVS) and the Conseil des Grands Crus Classes en 1855. These bodies either could not provide specific insight into pursuing counterfeiters, reported they do not actively pursue counterfeit wine cases, did not respond to email and phone calls or stated directly that they were 'not able to help with this matter'.

Hellman (2009) states an attempt by Laurent Ponsot of Domaine Ponsot to enlist help dealing with the discovery of counterfeit wines: 'Ponsot tried to enlist the French government's anti-fraud agency, which defends trademarks such as Chanel, Hermès, and Louis Vuitton, in tracking counterfeiters, but to no avail.' Smaller producers may need to collaborate in order to show there is a great enough impact from counterfeiting to get enforcement bodies to devote more resources to the issue.

Another potential issue with enforcement, particularly in many of the emerging markets, can be that government agreements do not exist between the market and exporting country. Regulated names such as wine regions or legally defined terms such as 'icewine' may not have any legal status in the markets where counterfeit wine is most common (Canadian Press, 2004). As a result, in the example of counterfeit icewine, 'The Canadian government, and by extension producers, is currently powerless to prosecute or take measures against those producing fake icewines outside of BC and Ontario as there is currently no federal definition or standard for icewine in Canada,' (Dorozynski 2009, pers comm.). This illustrates that an important component of fraud prevention is properly regulating and defining wine products and then including these definitions into international trade agreements.

The jurisdiction of a court also plays a part. Vineland Estates, an icewine producer in Ontario, Canada, started legal action on a case in China and was told that the case was docketed for review nearly six years later. In the meantime the questioned company continued to trade the supposedly counterfeit goods (Coffey, 2006). Hardy Rodenstock, who is being sued by William Koch for selling alleged counterfeit wines, refuses to acknowledge a New York court has any jurisdiction over him as a German citizen (Hellman, 2009).

Meadows (2009, pers comm.) discusses the need for the industry to collaborate: ‘a lack of coherent law enforcement and sanctions means that the problem will continue to grow.’ Based on the estimates of the size of the counterfeit wine market identified in this study, the industry will have to determine whether counterfeiting of wine is a significant enough threat to warrant working together to further explore how to deal with the issue.

Prevention of Counterfeiting – Anti-Fraud Methods

As the issue of counterfeit wine has become a more public issue, many anti-fraud companies have developed and marketed their technologies towards the wine industry. One of the aims of this dissertation was to provide a summary of the techniques used to combat wine fraud.

Methods to authenticate wine use tasting experience, personal relationship with sellers and, increasingly, high-level modern technology. Wine trade techniques for authentication commonly include examining the cork, capsule, glass, label, fill level, provenance and storage for as much of the wine’s history as possible, and in some cases sampling the wine (Spivak, 2008). A winery can also often verify from in-house records how many bottles were produced, particularly for the rarer large format bottles and sensory evaluation can be carried out by human panels (Parra, et al., 2006).

Efforts to combat counterfeiting have actually been going on for decades, suggesting that wineries have, to some level, been concerned about the problem of counterfeiting. Château d’Yquem labels have contained a watermark since 1984, bottle engraving has been used by many producers since the mid-90s, and a unique shaped bottle has been used by Haut Brion since 1958. However, none of these methods help if old bottles are used to re-package lesser wines (Agence France Presse, 2006). Cautious collectors

and producers have begun to ‘insist on seeing the destruction of the empties after some particularly serious wine tastings’ (Robinson, 2007).

There have been rapid changes in the technology of counterfeit prevention. However, counterfeiters are likely only a step behind so the longevity of any technology must be questioned. Quoted in Weed (2009), Jean-Charles Cazes of Château Lynch-Bages states, “For us right now there is no technology which we are sure would be viable on the market in 20 or 40 years.” Producers looking to implement anti-fraud technology have to determine whether it is economically worthwhile to employ some kind of technology now to build confidence in the product amongst consumers, even if they are not convinced in the longevity of the product.

The cost of adopting technology to fight counterfeiting is likely a decisive factor in the rate of adoption of new anti-fraud technologies. Prices for the different technologies researched for this paper can range from pennies per bottle to USD\$16 per bottle for Applied DNA Sciences botanical DNA product (Weed, 2009). Meadows (2009, pers comm.) states: ‘until the cost comes down, I do not foresee widespread use [of technology] by producers.’ Hubert (2009) adds to the issue of price: ‘Fraud doesn’t have to become a big issue as there are techniques to test wines...but they are not widely available, there is a lack of expertise and they are not cheap.’ Numerous authors (Penza & Cassano, 2004; Parra, et al., 2006) state the need for inexpensive, rapid methods to prove authenticity. The main challenge that anti-fraud companies face in meeting the needs of the industry, is to develop a method of proving or disproving authenticity that is rapid, affordable, readily available, has longevity and can be applied at various levels of the distribution chain.

A description of the anti-fraud technologies identified during the research can be found in the Appendices (page 63) as well as further information on advanced techniques to prove or disprove a wine’s authenticity (page 65).

Emerging Markets

One issue that keeps surfacing in the available literature on wine counterfeiting is the rapid growth of wine consumption in emerging markets such as China, Russia, India and Brazil and a corresponding potential increase in the level of wine counterfeiting. In Schroeder (2009), Bernard Magrez discusses counterfeiting increases in Russia after the fall of the Berlin wall due to considerable demand for fine

wine. By extension, the same demand in the rapidly growing Chinese, Indian and Brazilian markets may also prove attractive to counterfeiters.

Many of the references are specific to China which seems to be considered as a central player in the issue of counterfeit wine. Quoted in Schroeder (2009), founder of internet auction website IdealWine, Angeliqne de Lencquesaing states "[wine fraud] could take on a much more serious amplitude in Asia because the market is developing at a dazzling speed." In addition, Santini (2009), in an article on the increasing importance of Hong Kong as a hub of fine wine, states 'as with luxury handbags and watches, counterfeit wines in China represent a big challenge.' Sutcliffe MW also claims that there are high numbers of fakes in the Far East, 'particularly in wine collections put together over the last decade' (Suckling, 2009). It appears that the wine industry is watching the developments in China very closely in regards to counterfeit wine.

Due to the large amount of literature, further insights on emerging markets are provided in the Appendices (page 69).

Research Methodology

The research was designed to look at how counterfeit wine is impacting the business of wine by contacting and questioning producers, consumers, those trading fine wine, enforcement bodies, experts on the issue as well as companies providing anti-fraud technology. Some resistance to answer questions freely was expected due to the perceived negative association with the topic of fraud.

Producers & Consumers

Similar questions were addressed to both producers and consumers. Questions to producers focused on the impacts of counterfeit wine from a financial, marketing and enforcement aspect as well as an assessment of how their business has been impacted now and their outlook for the future. The consumer questionnaire was designed to explore whether consumer sentiment matched the realities identified by the wine producers or whether consumers had different perceptions.

The aims of the producer and consumer research were to:

- Determine producer & consumer experience with counterfeit wine
- Explore how business is impacted by counterfeit wine
- Identify the extent to which fraud will impact business in the future
- Explore what producers are doing and willing to do to combat fraud
- Identify the perceived causes associated with increasing or decreasing levels of counterfeit wine

The producer and consumer research was conducted through questionnaires offered on-line or by hard copy. Lists of producers were obtained through on-line lists, databases and existing wine industry directories. Requests to complete the questionnaire were sent to 260 producers of fine wine from all wine producing continents by email, fax or personal invitation. Follow-up requests were sent between January and April 2009. Responses were received from France, United States of America, Australia, New Zealand, Portugal and Chile.

A follow-up survey was sent to the same list of producers in January 2010, with a follow-up request later in the month, to obtain more open-ended data for analysis.

Consumer respondents were targeted through international contacts in the wine industry with responses coming from Australia, Canada, China, France, India, Japan, New Zealand, Singapore, Switzerland, Thailand, United Kingdom and United States of America. A posting was also placed on robertparker.com introducing the topic. Consumers were qualified by a question to confirm that they were purchasers of high-end wine.

The Wine Trade, Experts & Enforcement Bodies

A set of interview questions was presented to various experts, the trade and enforcement bodies. The questions were designed to touch on the same issues asked to consumers and producers. Trade respondents were contacted in Europe, USA and Australia. Some of these respondents also operate in Hong Kong. Experts contacted included Philippe Hubert from the Centre d'Etudes Nucleaires de Bordeaux-Gradignan, Allen Meadows of Burghound, Jancis Robinson MW, Maureen Downey of Chai Consulting, Bernard Magrez of Bernard Magrez, Laurent Ponsot of Domain Ponsot and Jim Budd of investdrinks.org. Enforcement bodies were contacted in the USA and Europe (see list on page 17).

Anti-Fraud Technology Producers

Background research identified a number of companies that are actively producing technology with a goal to prevent counterfeiting. A set of questions was posed to these companies to obtain a different perspective on how fraud might impact the business of wine. A list of the contacted companies is found in the Appendices (page 63).

Results & Analysis

An analysis of the original research is included below. The various research methodologies have been combined into sub sections that outline the key findings. Full results of the producer and consumer questionnaires are included in the Appendices. Further information on research response rates, non-response rates and requests for anonymity are also included in the Appendices (page 46).

How is Counterfeit Wine Impacting the Wine Business?

The central issue to this dissertation is to what extent counterfeit wine is impacting the business of wine. Results suggest that different aspects of the business of wine are impacted in different ways and to different levels. Specific details on the areas of impact are discussed in the sections below.

Table 2: Impact of counterfeiting wine on different business areas (Producers & Consumers)

<i>Area of Impact</i>	Don't Know		No Impact		Very Little Impact		Moderate Impact		Considerable Impact	
	<i>Prod</i>	<i>Cons</i>	<i>Prod</i>	<i>Cons</i>	<i>Prod</i>	<i>Cons</i>	<i>Prod</i>	<i>Cons</i>	<i>Prod</i>	<i>Cons</i>
Profitability	18%	3%	42%	10%	26%	38%	13%	35%	0%	13%
Reputation	18%	2%	24%	5%	18%	12%	11%	47%	29%	35%
Liability issues	21%	8%	32%	12%	16%	27%	13%	32%	18%	22%
Ability to set prices	18%	7%	45%	20%	21%	33%	11%	25%	5%	15%
Demand for rare/cult wines	18%	5%	29%	20%	26%	28%	21%	30%	5%	17%

Prod = Producer findings, Cons = Consumer findings.

Financial Impact

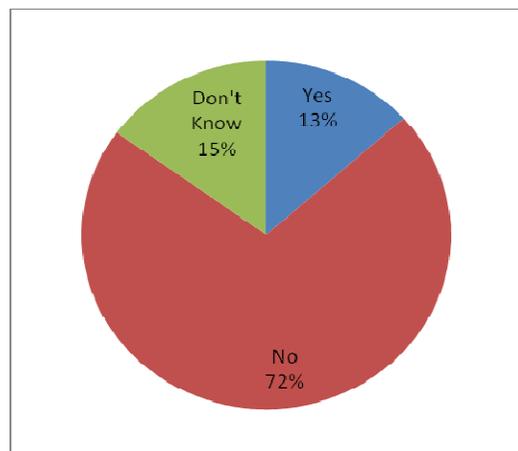
Producers did not see counterfeit wine as having a big impact on their business financially. Only five respondents (13%) stated it had a ‘moderate impact’. Many producers did comment that without knowing if their wine had been counterfeited it would be impossible to know what impact counterfeiting was having. Some comments referred to that counterfeiting ‘could have’ financial implications and identified potential costs such as ‘registering trade-marks and enforcing them,’ ‘researching and tracking down the counterfeiters and putting together a viable case’ and from ‘losing the trust of customers...sales could be affected by this.’

A potentially large financial impact could occur from sales that are lost directly to fake wines. Producer comments included the issue of ‘counterfeit products sold in lieu of the real product,’ and from a supply and demand point of view ‘counterfeiting can increase the quantity of the wines in the market and decrease the price and image of the brand.’ These findings show that producers are aware of potential impacts of fraud, even if they don’t feel they are currently being impacted.

Consumers had a different perception of how counterfeit wine might be impacting the wine business. Amongst consumers, 48% thought counterfeit wine had a ‘moderate’ or ‘considerable impact’ on the profitability of the wine business. This difference in perception explains both why producers are refraining from making investments in anti-fraud methods and at the same time why consumers think that producers should be doing more to tackle the issue. Only 13% of consumers thought that wine companies were taking strong enough measures to prevent counterfeiting of wine (Figure 1).

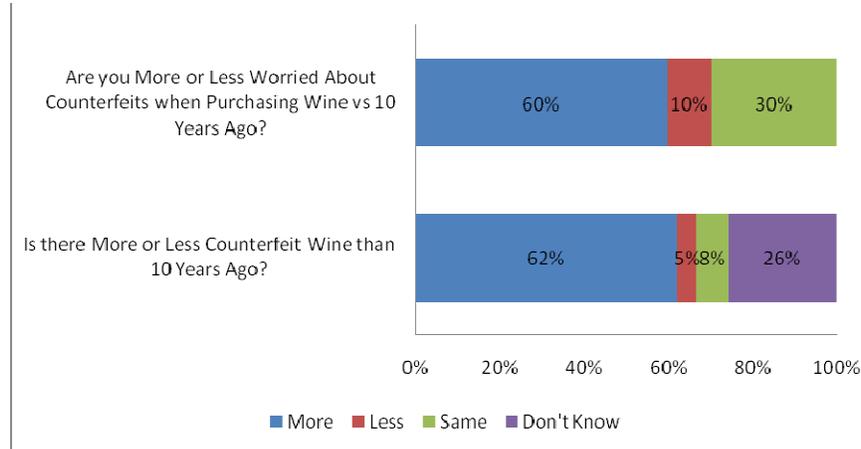
Consumers also appear to be increasingly concerned with counterfeit wine when purchasing fine wine. Six in ten (62%) of consumers believe there is more counterfeit wine in the market today than there was 10 years ago (Figure 2) and correspondingly 60% are more worried about counterfeits when purchasing wine versus 10 years ago. Over half (54%) also state that the issue enters into the decision making process when buying wine (Figure 3). This consumer concern is likely to have an impact on sales at all

Figure 1 - Are wine companies taking strong enough measures to prevent counterfeiting? (Consumers)



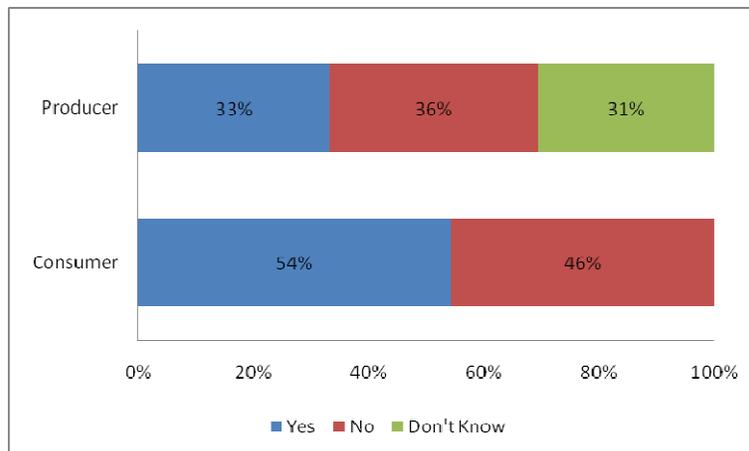
levels of the secondary market for fine wine impacting auction houses, merchants, retailers, wholesalers and personal vendors.

Figure 2 - Consumer thoughts on counterfeit wine in the market vs 10 years ago



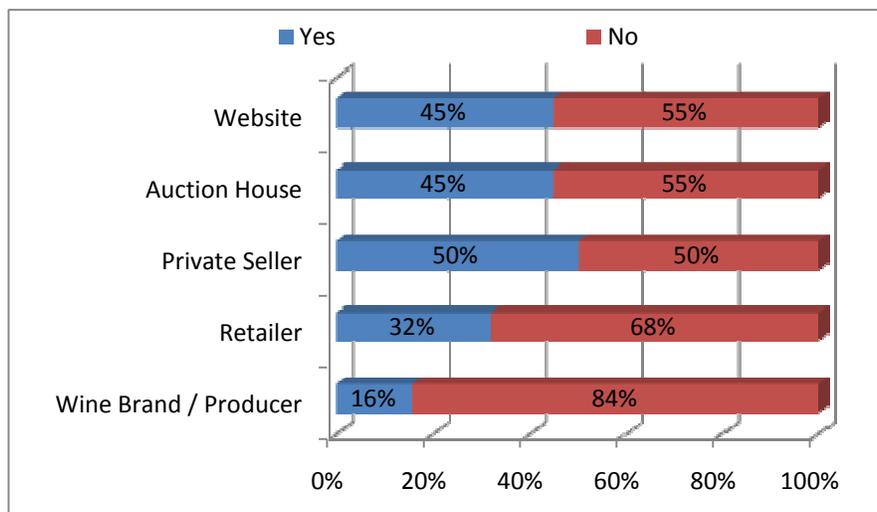
Producers, it seems, underestimate the influence that counterfeiting has on consumers with only 33% thinking it would enter into the consumer decision making process (Figure 3). However, 31% admitted they ‘didn’t know’ and some comments accurately point out that concern is often only on specific high-profile wines. Nevertheless, producers should be aware that counterfeiting is an issue that a majority of consumers consider when buying wine and suggests that consumers might be more attracted to products that are taking anti-fraud precautions.

Figure 3 - Does counterfeit wine enter into the consumer decision making process?



Auction houses, being a location where fine wines trade hands, also stand to be impacted financially. Over half (55%) of consumers reported purchasing wine through auction and yet 45% of all consumers stated that they have also refused to purchase wine through this medium due to concerns over authenticity (Figure 4). This has likely had a financial impact on sales and will continue to in the future. These consumer attitudes seem to be realized by those in the trade who state in the interviews that they are wary of creating panic amongst customers which might affect sales. Comments include that some customers are ‘paranoid’ or ‘scared off’ from trading in these wines.

Figure 4: Consumers who have refused purchase due to lack of confidence with authenticity (by channel)?



Trade respondents also report lost sales due to having stricter authentication standards. Many trade respondents reported they will no longer sell some of the highly sought after wines that are believed to be routinely counterfeited. These companies are not willing to risk their reputation on questionable wines but the result is the opportunity cost of lost sales to competitors. Consumers it seems will often go for price over provenance. One collector is reported to ‘factor fakes into the cost as part of the risk with buying wine on the secondary market’ while others deny there is an issue - ‘there is a whole counter-culture group...that just flatly deny there is a problem,’ (Downey, 2009).

Brand / Reputation Impact

More difficult to measure, but no less of an issue, is the impact that counterfeit wine can have on the reputation of a brand. Four in 10 producer respondents stated that counterfeit wine could have a ‘moderate’ or ‘considerable’ impact on their reputation (Table 2). Comments such as ‘the quality of any counterfeit can ruin a reputation’ and ‘fraud can abate the reputation of a brand’ showed that there is a realization of the damage that counterfeit can cause among producers. Brierley (2009) comments ‘the value hasn’t gone out of Pétrus from counterfeits but brand integrity is taken seriously,’ suggesting that brand may be more of an issue than finances for some fine wine producers.

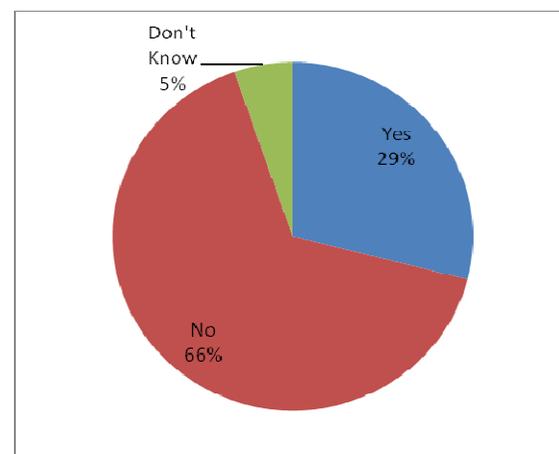
Consumers had a different perception of frauds impact on reputation with 82% thinking it has a ‘moderate’ or ‘considerable’ impact on the wine business (Table 2). This could be an important finding because a producer’s reputation is largely created by the attitudes of consumers. It suggests that producers should take the issue of protecting their brand reputation very seriously.

Another area where there is potential for a producer’s reputation to be impacted is the link with the wine trade. With the wine trade’s increased focus on due diligence to authenticate wine, there is a risk that producers may become implicated. The

trade often ‘seeks the aid of the chateaux’ in attempts to prove the provenance of a wine. If a producer helps in authentication and makes an incorrect conclusion, there will likely be damage to their reputation as well as potential liability.

Overall there is concern in the industry that counterfeiting could have an impact on brand and reputation and this seems to be the area where producers have the greatest level of concern. However, the concern does not yet appear to be serious enough to encourage action. Only (29%) of producers report taking measures to prevent counterfeiting (Figure 5). One reason for reluctance may be the fear that some producers have of associating their business with the topic of fraud. A spokesperson for the anti-fraud company Prooftag states that ‘producers think admitting their bottles need an authentication system, it’s admitting their wine is counterfeit, and this is bad press.’

Figure 5 - Producers taking measures to prevent counterfeiting of their wine



Liability Impact

Liability was not deemed to be as significant an issue as brand reputation amongst respondents (Table 2) but was rated as the second highest area of impact (moderate or considerable impact) by both producers (31%) and consumers (53%). This shows that there is awareness of the potential liability that could result from a case involving counterfeit wine. The majority of comments surrounding liability issues were also linked with a financial or brand impact and because of this have been included in the Financial and Brand Impact sections above.

Positive Impacts

A number of respondents identified potentially positive impacts associated with counterfeit wine. Respondents suggested that ‘greater vigilance by buyers may actually allow producers to charge more for the genuine article,’ and that ‘people may only look to purchase from the winery,’ which would benefit producer direct sales.

The wine trade could also benefit from having higher standards on their vigilance against counterfeiting. One respondent suggested that if more attention is put on fakes then auction houses and merchants with scrupulous authentication standards will likely benefit from increased sales. Anti-fraud technology companies also stand to gain business from the issue of counterfeit wine. Argonne Cap reported getting ‘some inquiries and publicity’ from the increased media attention on the topic.

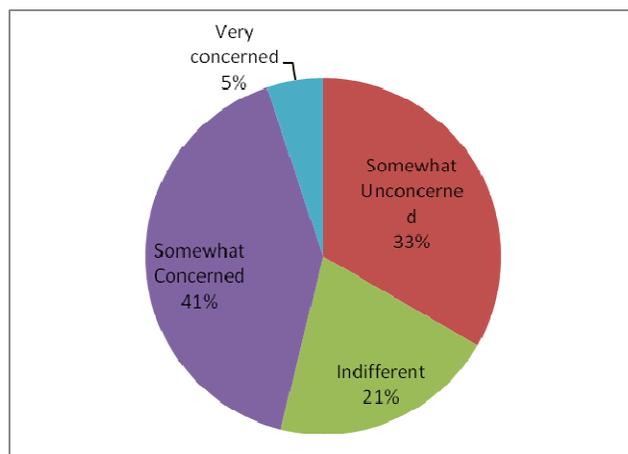
Conversely to many of the attitudes mentioned above, a positive impact on brand may also occur with an association to counterfeit wine. One producer refers to ‘positive PR [public relations] that might be generated by communicating that you belong to the elite group of wineries that are worth faking.’ The same producer goes on to comment ‘a wise producer should take measures against counterfeiting...and turn the extra expense into a marketing benefit.’ This opens up the idea to use anti-fraud technology from a marketing perspective as another means to differentiate a brand and at the same time allay consumer anxiety.

Counterfeit Wine & the Future

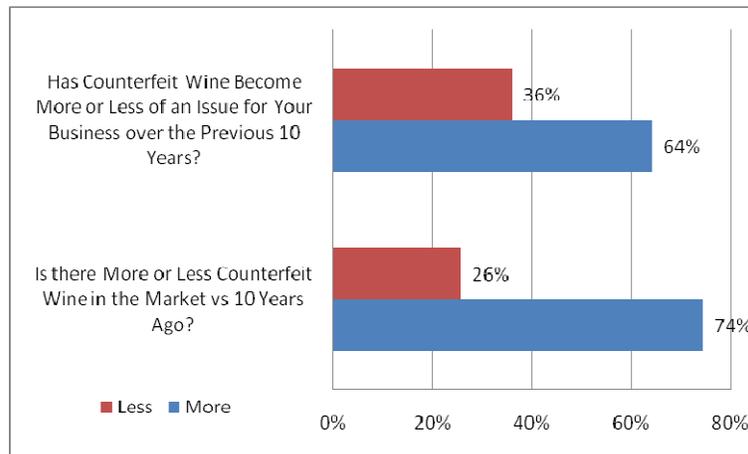
Six out of 39 producers (15%) claimed to be the victim of counterfeiting to some degree while 26% of consumers have experienced counterfeit wine. While these numbers show that there is real experience with counterfeit wine, it seems to be the future where there is greater concern.

When asked about the future 46% of producers were either ‘somewhat’ or ‘very’ concerned that they will be a target for counterfeiting in the next 10 years (Figure 6). Correspondingly, 59% (23 of 39) of producers feel that counterfeit wine will become a more serious issue for their business in the next 5-10 years with 61% of consumers agreeing.

Figure 6 - Producer concern that wines will be targeted by counterfeiters in next 10 years



Producers also believe there is more counterfeit wine in the market today with 29 of 39 responses (74%) agreeing that there are more counterfeit wines than there were 10 years ago and 64% say counterfeit wine has become more of an issue for their business over the past decade (Figure 7). These findings show that producers are concerned that the issue of counterfeit wine is increasing. The apprehension that they may be targeted suggests that producers will be looking more seriously at the issue of counterfeit wine as part of their ongoing business strategy. The question remains as to how much or how little investment should be made on an issue that may or may not affect them in the future.

Figure 7 - Producer views on Impact and Incidence of Counterfeit Wine in Last 10 Years

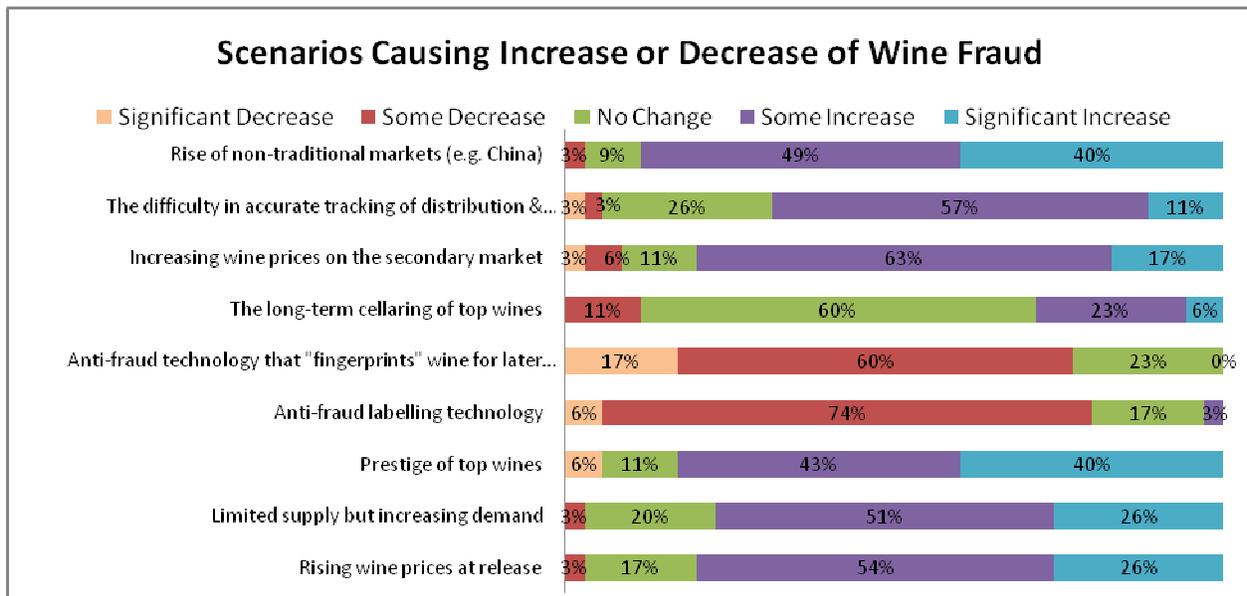
Respondents in general seem aware of how the current market may be attractive to counterfeiters. Comments frequently mentioned an increasing level of fraud in China, Asia and other emerging markets as well as increasing demand, rising prices and the ‘readily available technology to produce knock-offs’. Those who do not foresee counterfeit wine as increasing refer to the implementation of anti-fraud technology, increased awareness and the impact of the economic downturn.

Those in the trade appear to be split between optimism and pessimism. Some respondents stated that they ‘hope’ that the ‘current attention’ and ‘new measures [anti-fraud techniques]’ will deter counterfeiters. Other respondents were more pessimistic stating that the ‘perpetrators will find a way around the [anti-fraud] measures’ or suggested ‘any technology implemented will become obsolete.’ Another respondent sees counterfeit wine increasing - ‘supply is limited, demand is rising, pushing prices up so why would wine not follow the same pattern we have seen in other industries?’ Brierley (2009) is concerned that there will be a ‘shift to younger vintages and on a larger scale, e.g. Lafite 2005’ and sees potential for large scale counterfeits being sold to ‘inexperienced collectors in emerging markets.’ A change in focus from counterfeiters from rare old wines to higher volume young wines could have a significant impact on the industry. If younger wines are targeted then there will likely be a much bigger impact on lost sales to producers and they might correspondingly tackle the issue of counterfeiting more strongly.

Producer and consumer respondents were asked questions to determine what scenarios were likely to impact levels of fraud either negatively or positively. The rise of non-traditional markets (e.g. China) is seen as a very significant potential cause of increased wine fraud with 89% (producers) and 88%

(consumers) believing emerging markets will be associated with ‘some’ or ‘significant’ increase. The prestige of top wines (83% producer, 82% consumer), limited supply but increasing demand (77% producer, 88% consumer) and rising wine prices at release (80% producer, 84% consumer) are all considered to be scenarios that will have ‘some’ or ‘significant’ increase in the level of wine fraud. On the positive side, there is the view that ‘fingerprinting’ technology (77% producer, 79% consumer) and ‘labeling technology’ (80% producer, 88% consumer) should help to cause ‘some’ or ‘significant’ decrease in fraud (Figure 8). It appears that there is optimism surrounding the anti-fraud technologies but as few producers have implemented the techniques little benefit will be realized by the market as a whole.

Figure 8: Scenarios causing an increase or decrease in wine fraud (Producers)



Emerging Markets

The issue of the emerging markets is an interesting one generating many comments throughout the surveys. There appears to be much speculation amongst respondents that China in particular is likely to be a large source of counterfeit wine. The issues mentioned include the increasing amount of wine consumption in emerging markets, the increasing wealth of individuals, the prestige associated with top wines, the perceived lack of knowledge of the wine industry on the part of new consumers and an association with counterfeit products in other industries.

The wine trade, with rapidly increasing sales in emerging markets (Pomfret, 2009), however does not seem to consider these emerging markets any differently from those in North America and Europe. Respondent comments mentioned that there may be the temptation to take advantage of newly wealthy consumers but that ‘most of them are rich and drink great wine on a regular basis,’ and that ‘China has a long history of dealing with fakes so buyers there are more aware and have very stringent standards.’

The anxiety over counterfeit wine in emerging markets seems largely to be based on suspicion and speculation at this point, outside of a few examples of evidence. Producers and consumers are cautious and suspicious towards emerging markets while the trade, with real experience dealing in some of these markets, does not seem to be as concerned. The attitudes seem to be based more on the fear of the unknown than any real evidence but suggest that all sectors of the industry will likely keep a close watch on any developments in the emerging markets.

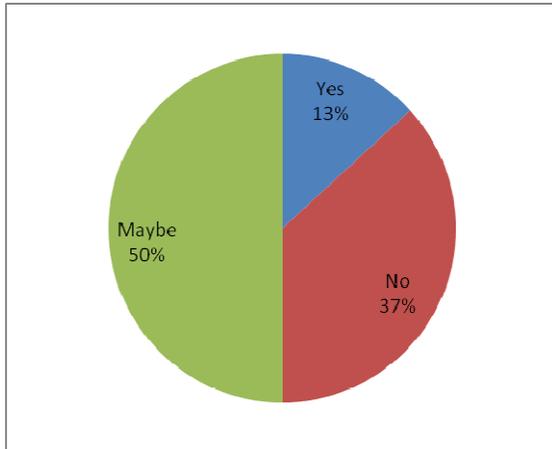
Prevention of Counterfeiting

Of 38 producer respondents, only 29% reported to be taking measures to prevent counterfeiting (Figure 5). This finding shows that while concerned, a majority of producers do not see the issue of counterfeit wine as justifying spending in counterfeit prevention. Amongst those that are using anti-fraud techniques, the most common methods employed included ‘tracking sales on the secondary market’ (82%), or by using ‘labelling technology’ (73%), followed by ‘human policing’ (64%), using ‘vintage dated corks’ (55%), and ‘bottle numbering’ (55%) (Figure 9). Other comments on prevention methods included creating a specific bottle, other packaging technologies and inventory control of packaging materials.

Figure 9 - Actions being undertaken amongst those using methods to prevent counterfeiting



Figure 10 - Producers interested in purchasing anti-fraud technology

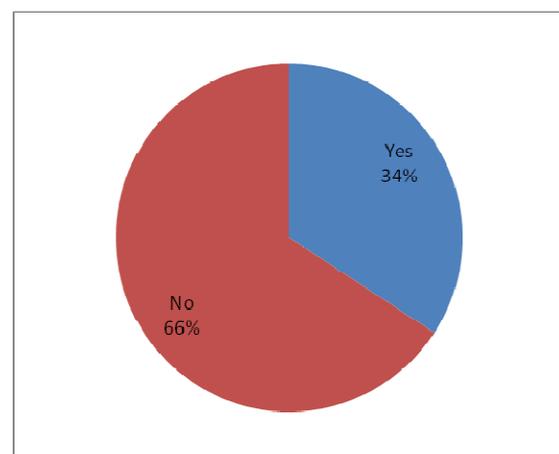


The lack of interest in investing in anti-fraud technology is shown with only 13% of producer respondents interested in purchasing new anti-fraud technology (Figure 10). Comments suggested that producers would look into the technology if they felt they were specifically targeted by counterfeiters and ‘according to cost and accessibility.’ The large number of ‘maybe’ responses (50%) again shows the “wait and see” approach that many producers are taking on the counterfeit wine issue.

Respondents did show awareness of the different anti-fraud technologies available, maybe due to the fact that a third of producers (34%) reported having been contacted or offered for sale anti-fraud technology within the last two years (Figure 11). It appears that those producers who have not implemented technology do not yet see it as a justified investment. One anti-fraud company, Collotype, who had been widely publicized for developing DNA label technology for Eileen Hardy Shiraz, commented that they are no longer pursuing the wine industry for clients and that no wine clients are currently using their technology (Collotype, 2010). This is an interesting finding suggesting that anti-fraud companies may be switching their attentions away from the un-reactive wine industry due to lack of interest for their products.

Analyzing the consumer data illustrates two important findings with regard to prevention of counterfeiting. Firstly, only 13% of consumers think wine companies are taking strong enough measures to prevent counterfeiting (Figure 1). Secondly, 75% of consumers state they would be more likely to purchase a particular brand knowing that they use anti-fraud technology (Figure 12). This suggests some marketing and public relations opportunities to be associated with adopting anti-fraud technology. Anti-fraud company Argonne Cap (2009) commented on the potential appeal in

Figure 11 - Producers who have been contacted/offered products for sale by anti-fraud technology company in the last two years



investing in anti-fraud technology purely from a marketing perspective. They suggest that using anti-fraud technology shows the value of a product in the sense that it is so special that it needs protection. Prooftag (2009) commented that they believe given a shelf full of wines, consumers would be more likely to choose the one using anti-fraud technology. This again illustrates potential marketing benefits from an investment in anti-fraud technology.

The second producer questionnaire, which was used to gain further insight on issues of counterfeit wine, asked whether wineries had analyzed the cost of anti-counterfeiting technology. Most of the respondents reported they have not looked at the cost yet as they don't deem it to be enough of an issue. One respondent identified a cost of AUD\$1-2 per bottle which they found 'economically unviable.' These findings again show the reluctance of producers to act on the issue of counterfeit wine because they cannot financially justify an investment.

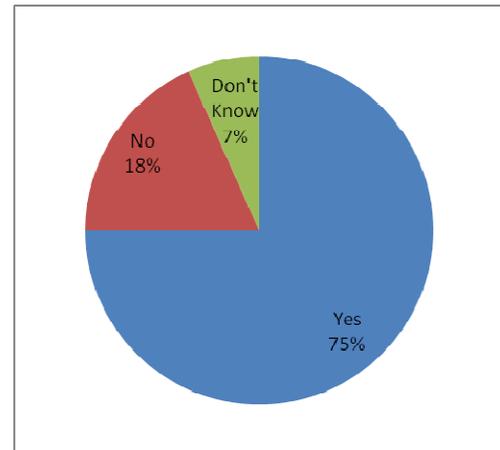
Trade responses suggest that many changes have already been made in the way they analyze lots for sale with the goal of preventing counterfeit wine being sold. A number of respondents suggested that the 'degree of investigation the wine goes under is directly linked to value.' One auction house reports that for high value lots, 'two representatives will independently look at the wine and a third person if there is the slightest suspicion.' All of these efforts in increased due diligence should have an effect on less counterfeit wine making it to market.

Responsibility for Dealing with Counterfeit Wine

Respondents were asked questions on how satisfied they are with current industry efforts in managing fraud and who should be responsible for dealing with it. The idea of developing industry wide standards to contend with counterfeiting was also posed to producers and consumers.

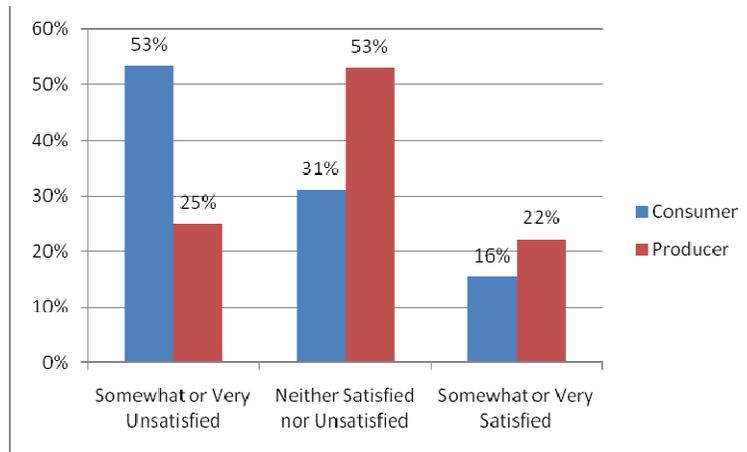
Producers, when asked how satisfied they were with the efforts by the wine industry as a whole to combat fraud, had mixed views. Over half (53%) said they were neither satisfied nor unsatisfied (Figure 13). This might again reflect the fact that many producers do not view counterfeiting as a significant enough problem to warrant action being taken. However, over half of consumers (53%) were unsatisfied with

Figure 12 - Consumers more likely to purchase a brand using anti-fraud technology



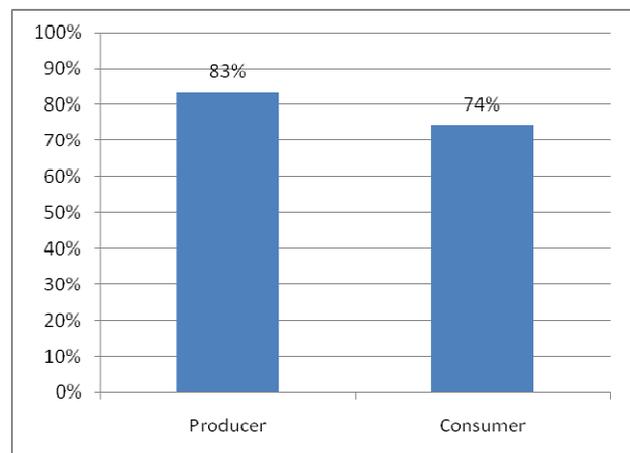
industry efforts. If there is a push for change and demands on the industry to do more, then it will likely be consumer rather than producer driven.

Figure 13 - Satisfaction with efforts by the industry to combat fraud



The concept was posed to producers and consumers as to whether they would like to see industry wide standards developed to help combat fraud. This idea received very strong support from both producers (83%) and consumers (74%) (Figure 14). The support for developing industry wide standards is consistent with the concern producers and consumers have regarding counterfeit wine in the future. With both producer and consumer support, the timing might be right for the wine industry to do what many other industries have done (Vithlani, 1998; Pira International, 2009) and create an international body to look further into measuring the impact that counterfeiting has on the wine industry.

Figure 14 - Those who would like to see industry wide standards developed to help combat fraud



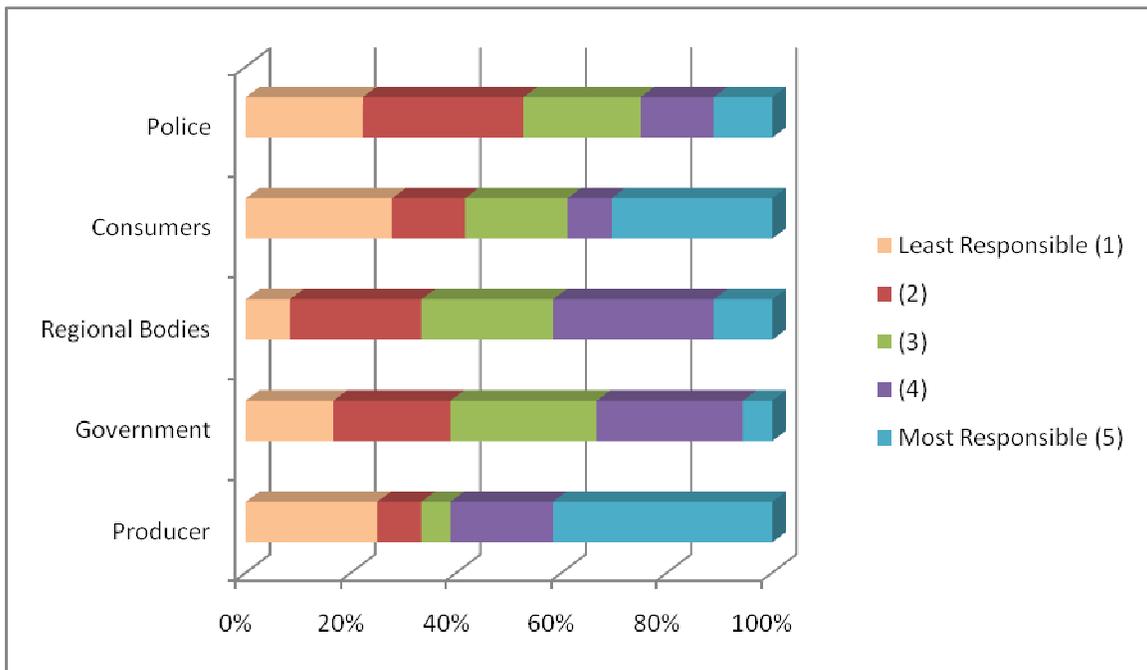
When asked who should be responsible for dealing with counterfeit wine, producer and consumer respondents generally agreed that producers should bear the responsibility (61% of producers rank themselves as first or second ‘most responsible’) (Figure 15). This is an interesting finding considering that while producers feel ‘responsible’

for dealing with counterfeit wine, they are at the same time cautious in acting on the issue and adopting anti-fraud methods.

This finding is also interesting in how it relates to the future. While producers overall are not currently feeling a strong impact from counterfeit wine, they are concerned for the future and they do feel responsible for dealing with the issue. This suggests, again, that producers expect to have to consider counterfeit wine and prevention methods more in their business decisions in the future.

Consumer responses were similar to those of producers with the exception that 49% considered themselves to be first or second most ‘responsible’. This suggests that consumers expect to have to maintain a ‘buyer beware’ attitude when purchasing fine wine.

Figure 15: Ranking of who is responsible for combating fraud (Producers)

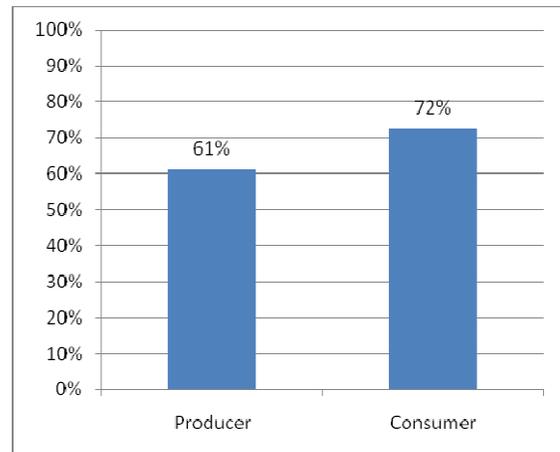


Making the Issue of Counterfeit Wine Public

There are mixed opinions on whether the issue of counterfeit wine should be a more public issue. Six in ten (61%) producers said ‘yes’ and 39% ‘no’. Seven in ten (72%) consumers said ‘yes’ (Figure 16). Concerns revolved around ‘publicity damaging the image of fine wine’ on one hand and a ‘need [for the issue] to become public to be dealt with effectively’ on the other.

In an open-ended question approximately 50% of producers agreed that wineries are unwilling to publicly discuss the issue with concerns that it is ‘better dealt with behind closed doors.’ This is an interesting finding in that while producers agree that industry wide standards would be helpful, they do not agree on whether it should be dealt with in the open or in a more clandestine manner. If industry wide standards were to move ahead, this would clearly be a major issue to overcome.

Figure 16 - Those who would like to see counterfeit wine become a more public issue



Conclusions

The current market for fine wine has created an attractive opportunity for counterfeiters. Wine prices are high, demand is high, supply is low and there is the technology and know-how to produce accurate knock-offs of many fine wines. The hypothesis for this research is that these conditions have created an environment where producers of fine wine should be considerably worried about the impact that counterfeiting may have on their business.

There is an increasing body of literature that provides evidence that counterfeiting of fine wine exists. However, within this literature it was not possible to find an accurate estimate for the size of the counterfeit wine market. This research has produced an estimate that the global problem is worth between USD\$6 million and USD\$30 million. Existing literature is also very limited in regards to how counterfeit wine specifically impacts the business of wine. The findings of this paper show impact in financial, brand and liability areas as well as a few positive impacts. The paper also highlights the differing views amongst the parties involved, attitudes towards fraud now and in the future and who bears the responsibility for dealing with the prevention of counterfeit wine.

The financial impact on the wine business is very difficult to measure but the estimated size of the counterfeit wine market shows it is significant. The fine wine trade is very sensitive to the issue of counterfeit wine as they appear to have been impacted the most financially. The trade has increased their standards of due diligence on wine lots and many have discontinued selling some highly sought after wines that are routinely the target of counterfeiters. The increased costs of due diligence and lost sales have had a financial impact on the trade. Consumers seem to be showing anxiety that is impacting the way they buy fine wine. They are more careful and concerned about what they buy and from where. This is likely having an impact on sales of fine wine.

Producers appear to be very concerned about a potential impact on their brand reputation. They are careful to avoid creating fear amongst the customer base and because of this many are reluctant to discuss the issue of counterfeiting. This fear of alienating customers has created an interesting divide in the industry about whether counterfeiting should be a more public issue. Overcoming the issue of whether to deal with counterfeit wine openly or behind closed doors is likely to remain a key issue in any future debates.

A further area of potential impact that has largely affected the secondary trade is liability. If a consumer suspects a wine is fake then they may seek legal recourse against those who sold them the wine, something that appears to be happening with increasing frequency. With the high costs of fighting a legal battle there could be significant financial impact on a business.

Some potentially positive impacts on the wine business were also identified during the research. Increased public attention on the issue could both drive sales directly to the producer to remove the risk of middlemen or drive sales to more scrupulous merchants and auction houses that have a solid reputation. There may also be a benefit to adopting anti-fraud technology and utilizing this from a marketing perspective to differentiate a brand from the competition.

There seem to be differing views as to how the various parties involved are impacted by counterfeit wine. Producers do not currently feel a major financial impact from counterfeit wine on their business and because of this are not investing in prevention or enforcement. Consumer views, though, differ from those of producers. While both parties agree that counterfeit wine is increasing and will have an increased impact on the business of wine in the future, consumers are under the impression that counterfeiting is currently having a bigger impact on the business of producers than it really is. This creates the conflicting situation where producers can't justify spending on anti-fraud technology based on how counterfeiting is impacting their business but at the same time consumers are expecting them to do more. This disparity could create a feeling of distrust amongst consumers that could impact their trust in fine wine and affect their buying behaviour.

The impact of wine fraud now versus the future also raises some interesting conclusions. Producers currently face only minor impact from fraud yet they are concerned that they may be targeted in the future. Producers also feel that they are largely responsible for dealing with the issue in the future yet this feeling of responsibility does not appear strong enough to act on. The secondary market and those buying and selling fine wine are where counterfeiting likely has the greatest financial impact yet both these sectors of the market are largely powerless to make changes to prevent counterfeiting other than due diligence in what they buy and sell. The onus is on producers to implement anti-fraud technology, yet they have the least to gain from such an investment. Because of this, it will be difficult to convince producers to invest either time or money into addressing the issue.

Nonetheless, in terms of prevention, there is some optimism that anti-fraud methods can assist in deterring counterfeiters but with limited adoption of the techniques by producers these benefits may not be realized. From an industry point of view, there is currently no organized global approach to addressing counterfeit wine. The onus for prevention and enforcement falls largely into the hands of the industry and those who are directly affected by counterfeiting. There appears to be considerable interest by producers and support from consumers to create industry wide standards to tackle the issue of fraud. The author believes that the logical next step is for the industry to collaborate and further explore the realities of counterfeit wine and then to develop an industry wide plan for prevention and enforcement.

It is clear that the market conditions are ideal for an increase in the incidence of counterfeit wine and that the industry is aware of the issue and how it might impact the business of wine. Producers are clearly concerned but without seeing a direct impact on their business they are unable to justify action and investment on preventing it. Unless there is a turn of events that force the hand of producers, justifying the expense of anti-fraud efforts, then the industry is likely to maintain cautious interest only towards the issue of counterfeit wine.

Appendices

Approved Synopsis

Title: Counterfeit Wine – Its impact on the business of wine

Aims and objectives

The aim of this dissertation is to assess, amongst producers of cult wines (definition under Research Context), how serious the issue of wine fraud is believed to be. The hypothesis is that a producer of a small quantity of expensive wine is likely to be concerned about fraud for the damage it can do to their business both financially and in relation to brand reputation.

Wine fraud makes frequent appearances as an issue in the modern media. However, the issue seems to disappear shortly after the sensational nature of the event, only to rise again with the next incident. The topic seems to be taboo. This dissertation aims to investigate why fraud is, or perhaps isn't, a serious enough issue to warrant significant actions by both producers and consumers to bring it to an end. The dissertation will explore why fraud isn't more of a prominent issue in the wine world. Fraud is a sensitive subject and the potential negative associations could do considerable damage to the reputation of a wine. The dissertation aims to determine whether it may be worth formally addressing the issue of fraud in the wine world in greater depth.

In researching the seriousness of the issue of fraud as it affects wine businesses, this dissertation will also attempt to determine attitudes to wine fraud amongst purchasers/consumers of cult wines and to provide a summary of the techniques being used to combat wine fraud.

Research Context

This dissertation will be analyzing the re-occurring issue of fraud in the wine industry. Fraud appears in many forms and can range from untruth in labeling to receiving money for selling wine that does not exist, or even the more creative but sinister counterfeiting bottles of well known wines by persons unknown. This dissertation will concentrate on the issue of counterfeit, or fake, wines where the product inside the bottle does not match what is written on the label.

Wines more likely to be targeted by fraudsters are expensive wines with limited availability and high demand. It is these wines that will be the focal point of this dissertation and they will be referred to as ‘cult wines’.

Fraud, it seems, has been an issue for as long as wine has been produced. Estimates are that as much as 5% of the rare vintages sold on secondary markets are counterfeit (Wine Spectator, 2007). Wine is a product that is a desirable target for counterfeiters for a number of reasons: few consumers know what cult wines should taste like, the taste changes over time, many wines remain unopened for decades, it is difficult to track distribution of wines and cult wine is currently very expensive and in high demand.

Literature research will specifically seek out attitudes towards fraud amongst producers and consumers and the impact fraud has on the business of wine – both financially and in relation to brand reputation. Both academic and consumer oriented literature will be researched. To answer the secondary question of methods to combat fraud, research will cover literature as well as direct interviews with producers of anti-fraud technology to produce a summary of anti-fraud methods. Human policing will also be considered.

Relevance to the wine industry

The relevance of this research to the industry will be in a number of areas. In view of the high price, limited supply and high demand of cult wines the incidence of fraud is likely to increase in the future making this a topical issue.

Firstly, this study will provide evidence in the form of a questionnaire of cult wine producers to determine the perceived importance of the issue of counterfeiting fraud to the wine world. This will be achieved by a study amongst producers of cult wines. Results will point towards the areas of impact on running a successful wine business and what options could be taken in dealing with fraud in the wine industry in the future. If producers determine fraud to be an issue, then research on methods to deal with counterfeiting will be a valuable starting point for producers to begin working to put an end to the problem and developing industry standards for prevention. If fraud is not deemed to be a serious issue then the research will identify why this might be the case and whether this is a justified attitude by the producers or an oversight that could potentially be a mistake and damaging to the wine industry.

Secondary relevance to the industry will be opinions of consumers towards fraud and a summary of the current methods and technologies available to combat fraud. Information on consumer attitudes could add further weight to whether the industry needs to work together to stamp out counterfeit wines.

Research methodology

The methodology of the dissertation will seek to answer the following key questions regarding attitudes to wine fraud:

- Producers – is fraud a serious issue that could impact the success of your business? How can/does fraud impact your business? What methods, if any, are you taking to combat fraud? Are you aware of any new products/methods to combat fraud and what are they? Is there a willingness to open dialogue on the issue of fraud or is there a fear of backlash against pricing and popularity of high demand cult wines?
- Consumers – does the issue of fraud enter your purchasing decisions of cult wines?
- Producers of anti-fraud methods – why is wine fraud a growth area of business and what methods are you working on to deal with counterfeit wine?
- Auction houses and Merchants – how much of an issue is fraud to buyers and sellers of wine in the secondary market and is this having an impact on the value of fine wine?
- How easy is it to fool an experienced taster with a counterfeit wine?

The methodology planned to achieve these results incorporates research in a number of areas:

- Questionnaires to producers of cult wine around the world to determine their attitudes towards the significance of the issue of fraud as it relates to the impact on their business
- Questionnaires to consumers of cult wines around the world relating to their own concerns about fraud and whether these concerns impact what they buy and whom they buy from
- Interviews with producers of anti-fraud technology to determine the demand for their products and what products they are developing that may have a global impact on reducing wine fraud
- Interviews with those producers displaying strong views on the issue of fraud (identified during the questionnaire process)
- Interviews with those trading in fine wine in north America, the UK and Australia
- Literature research to look at the historic impact of wine fraud, modern cases of fraud, methods to combat fraud, reported consumer perceptions towards fraud and the impact fraud is having/can have on a wine business

The producer sample base will be selected through on-line lists, databases and existing wine industry directories. Producers of cult wines will be targeted. Questionnaires will be sent to over 225 cult wine producers. The number of questionnaires expected to be returned is unpredictable as the controversial nature of the subject will deter some potential respondents. The consumer sample base will be difficult to verify in terms of accuracy due to the inability to prove whether or not a respondent is truly a collector of cult wine. The consumer sample base will be obtained through personal contacts in the wine industry. Both the producer and consumer questionnaires will provide a non-statistically significant contribution to the research but serve to identify key issues that should be further explored and provide a general idea of the opinions of the industry.

The questionnaires will be conducted on-line through a web-survey service. This will make it easy for the respondents to complete and submit the questionnaires in their own time and should help to increase the reply rate.

Literature research will begin by obtaining a broad spectrum of academic and consumer literature surrounding the subject. This literature will be analyzed to create a background for the first hand original research.

Proposed time schedule/programme

<i>November</i>	Begin literature research. Organize tasting panel. Develop questionnaires for producers and consumers.
<i>December</i>	Continue literature research. Questionnaires sent out via email.
<i>January</i>	Continue literature research. Identify targets for interviews and schedule interviews. Select wines for tasting and arrange samples. Write introduction and literature review sections and send to mentor as drafts. Data collection.
<i>February</i>	Interviews conducted. Tastings conducted with tasting panel. Follow-up on questionnaire return. Begin main text. Discuss data collection progress with mentor.

<i>March</i>	Analyze results from questionnaires. Follow-up interviews and literature study to verify information. Submit methodology draft to mentor. Discuss primary results with mentor.
<i>April</i>	Complete draft dissertation document and send to mentor for comments.
<i>May</i>	Continue fine points of verifying data and writing and editing dissertation text. Bibliography and Appendices.
<i>June (30th deadline)</i>	Finalize dissertation and submit.

Research Response Rates

Interviews were conducted with the fine wine trade, wine experts and those involved in anti-fraud and enforcement. 40 people were contacted in the auction (14), enforcement (12) and anti-fraud (9) business as well as 5 industry contacts with some expertise on the topic. A total of 27 interviews were conducted by email, phone or personal communication with 17 able to provide information included in the results. Those not included stated they did not want to discuss the topic due to its sensitive nature or because they are involved in legal cases involving counterfeit wine.

The original Producer Questionnaire had 67 potential respondents enter the survey with 43 completing the majority of the questions. With a limited estimated total population size of 300 producers (of cult wine) this sample has a margin of error of $\pm 13.9\%$ assuming 50% response to any one question at 95% confidence level. The follow-up Producer Questionnaire had 14 respondents. The Consumer Questionnaire had a total of 57 respondents completing all questions. The margin of error is $\pm 13\%$ at 95% confidence level. There was some drop out as 77 respondents started the questionnaire. Consumer respondents represented 39 different cities, 11 countries and 4 continents. 64% considered themselves a 'serious wine collector', 23% 'casual wine collector' and 7% 'occasional wine collector.'

Non-Responses & Anonymity

Non-responses suggest a potential reluctance to participate due to a perceived negative association with the counterfeit wine topic. One producer replied to the survey invite with: "We appreciate your efforts in studying this complicated subject. You can be assured we have been fighting on this field for over 20 years now, but are not willing to share all this classified information." It is likely that many others had similar sentiment and declined to respond to the survey questions.

Others agreed to participate in an interview and be named in the Bibliography on the condition that no specific quotes were attributed to them personally.

Producer Questionnaire

Full results – Producer Questionnaire

Below are the full results downloaded from the online survey company Constant Contact for the Producer Questionnaire. Results reported in the dissertation text have been adjusted to remove the ‘no response’ categories which comprises those respondents who entered the survey but did not answer any questions.

Please enter the information indicated below. Please use the 'Company Name' field to enter your Winery or Château name.

First Name	43
Last Name	43
Job Title	43
Company Name	43
Work Phone	43
Email Address	43
City	43
Country	43

What is the name of your winery's most prestigious wine?

43 Response(s)

Please rank the following items in terms of importance to your winery:

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Least, 6 = Most important					
	1	2	3	4	5	6
Producing quality wine	14 34%	0 0%	0 0%	0 0%	1 2%	26 63%
Environmental sustainability	0 0%	8 20%	16 39%	8 20%	9 22%	0 0%
Protecting against fraud	11 27%	9 22%	7 17%	2 5%	4 10%	8 20%
Brand reputation	0 0%	9 22%	5 12%	8 20%	19 46%	0 0%
Profitability	2 5%	7 17%	9 22%	19 46%	3 7%	1 2%
Liability	14 34%	8 20%	4 10%	4 10%	5 12%	6 15%

11 Comment(s)

To your knowledge, has your winery ever been the victim of wine counterfeiting? (ie. Discovered wine labelled as being from your winery but containing a lesser wine inside)

	Number of Response(s)	Response Ratio
Yes (Please briefly describe incident below)	6	8.9%
No	33	49.2%
No Responses	28	41.7%
Total	67	100%
7 Comment(s)		

How concerned are you that your wines will be a target for counterfeit within the next 10 years?

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Very Unconcerned	Somewhat Unconcerned	Indifferent	t Concerned	Very concerned
	0	13	8	16	2
	0%	33%	21%	41%	5%

In your opinion, would you say there is more or less counterfeit wine in the market today than there was 10 years ago?

	Number of Response(s)	Response Ratio
More	29	43.2%
Less	10	14.9%
No Responses	28	41.7%
Total	67	100%
15 Comment(s)		

Thinking specifically about your winery. Has counterfeit or fraudulent wine become more of an issue or less of an issue over the previous 10 years?

	Number of Response(s)	Response Ratio
More	25	37.3%
Less	14	20.8%
No Responses	28	41.7%
Total	67	100%
16 Comment(s)		

Looking at the future, are you concerned that counterfeit wine will become a more serious issue for your business in the next 5-10 years?

	Number of Response(s)	Response Ratio
Yes (Please comment why below)	23	34.3%
No (Please comment why not below)	16	23.8%
No Responses	28	41.7%
Total	67	100%
31 Comment(s)		

Of wines sold on the secondary market, what percentage would you estimate to be counterfeit? (Please enter an exact % estimate - no ranges please)

39 Response(s)

What impact does counterfeiting of high-end wine have on your business in the following areas:

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Don't Know	No Impact	Very little Impact	Moderate Impact	Considerable Impact
Profitability	7 18%	16 42%	10 26%	5 13%	0 0%
Reputation	7 18%	9 24%	7 18%	4 11%	11 29%
Liability issues	8 21%	12 32%	6 16%	5 13%	7 18%
Ability to set prices	7 18%	17 45%	8 21%	4 11%	2 5%
Demand for rare/cult wines	7 18%	11 29%	10 26%	8 21%	2 5%
10 Comment(s)					

Is your company taking measures to prevent counterfeiting of your wine?

	Number of Response(s)	Response Ratio
Yes	11	16.4%
No	25	37.3%
Don't Know	2	2.9%
No Responses	29	43.2%
Total	67	100%
13 Comment(s)		

If you take measures to prevent counterfeiting, which of the following methods does your company use:

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Don't Know	Yes	No
Labelling technology	0 0%	8 73%	3 27%
Human policing	0 0%	7 64%	4 36%
Tracking sales on the secondary market	0 0%	9 82%	2 18%
Vintage dated corks	0 0%	6 55%	5 45%
Bottle numbering	0 0%	6 55%	5 45%
1 Comment(s)			

If you answered 'Yes' to using Human Policing above, please describe what techniques you use in human policing to prevent wine fraud?

7 Response(s)

Would your winery be interested in purchasing new anti-fraud technology to help combat fraud?

	Number of Response(s)	Response Ratio
Yes	5	7.4%
No	14	20.8%
Maybe	19	28.3%
No Responses	29	43.2%
Total	67	100%
4 Comment(s)		

Have you been contacted/offered products for sale by a company that produces anti-fraud technology in the last two years?

	Number of Response(s)	Response Ratio
Yes	13	19.4%
No	25	37.3%
No Responses	29	43.2%
Total	67	100%
1 Comment(s)		

Are you aware of any other methods to combat wine fraud, and if so what are they?

18 Response(s)

Would you like to see the issue of counterfeit wine become a more public issue?

	Number of Response(s)	Response Ratio
Yes (Please briefly comment why below)	22	32.8%
No (Please briefly comment why not below)	14	20.8%
No Responses	31	46.2%
Total	67	100%
26 Comment(s)		

How satisfied are you with the efforts to date by the wine industry as a whole to combat wine fraud?

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Very Unsatisfied	Somewhat Unsatisfied	Neither Satisfied or Unsatisfied	Somewhat Satisfied	Very Satisfied
	1	8	19	7	1
	3%	22%	53%	19%	3%

8 Comment(s)

Would you like to see industry wide standards developed to help combat fraud?

	Number of Response(s)	Response Ratio
Yes	30	44.7%
No	6	8.9%
No Responses	31	46.2%
Total	67	100%
10 Comment(s)		

Please rank the following in order of who you consider to be least to most responsible for combating fraud:

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Least Responsible				
	1	2	3	4	5
Producer	9 25%	3 8%	2 6%	7 19%	15 42%
Government	6 17%	8 22%	10 28%	10 28%	2 6%
Regional Bodies	3 8%	9 25%	9 25%	11 31%	4 11%
Consumers	10 28%	5 14%	7 19%	3 8%	11 31%
Police	8 22%	11 31%	8 22%	5 14%	4 11%
4 Comment(s)					

In your opinion, do you think the issue of counterfeit wine enters into a consumer's decision making process when they buy high-end wine?

	Number of Response(s)	Response Ratio
Yes	12	17.9%
No	13	19.4%
Don't Know	11	16.4%
No Responses	31	46.2%
Total	67	100%
6 Comment(s)		

For the following list, please rate whether you consider each of these scenarios is likely to cause an increase or decrease in the incidence of fraud in the future:

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Significant Decrease	Some Decrease	No Change	Some Increase	Significa
					nt Increase
Rising wine prices at release	0 0%	1 3%	6 17%	19 54%	9 26%
Limited supply but increasing demand	0 0%	1 3%	7 20%	18 51%	9 26%
Prestige of top wines	2 6%	0 0%	4 11%	15 43%	14 40%
Anti-fraud labelling technology	2 6%	26 74%	6 17%	1 3%	0 0%
Anti-fraud technology that "fingerprints" wine for later comparison	6 17%	21 60%	8 23%	0 0%	0 0%
The long-term cellaring of top wines	0 0%	4 11%	21 60%	8 23%	2 6%
Increasing wine prices on the secondary market	1 3%	2 6%	4 11%	22 63%	6 17%
The difficulty in accurate tracking of distribution & consumption	1 3%	1 3%	9 26%	20 57%	4 11%
Rise of non-traditional markets (e.g. China)	0 0%	1 3%	3 9%	17 49%	14 40%
3 Comment(s)					

Do you think that wineries are unwilling to publicly discuss the issue of counterfeit wine due to fears that a more public profile of fraud may have a negative impact on their business? (Please comment below)

35 Response(s)

Do you have any further comments you would like to make on the issue of counterfeit wine?

15 Response(s)

Would you be willing to be interviewed by phone to provide further details and opinions for the dissertation?

	Number of Response(s)	Response Ratio
Yes (Please enter preferred phone number and email for contact below)	11	16.4%
No thank you	23	34.3%
No Responses	33	49.2%
Total	67	100%
12 Comment(s)		

Follow-up Producer Questionnaire

A follow-up questionnaire was sent to producers in early 2010 to ask open-ended questions to add further analysis to the results. The questions asked are shown below.

1. Please enter the following information. This information will not be shared with anyone:

First Name	14
Last Name	14
Company Name	14
City	14
Country	14

2. Many wine producers are concerned that fraud is increasing or will increase. Why do think producers are concerned and what do you see as the consequences? Please give actual examples.

14 Response(s)

3. How and why could counterfeiting of wine impact the business of wine? How, specifically, could it affect potential income and profits?

14 Response(s)

4. Is counterfeit wine impacting YOUR business success? If so, how is it impacting your business?

13 Response(s)

5. There are many technologies being marketed to wine producers to help fight counterfeiting. Has your winery analyzed the costs? Do you think these technologies are worth the investment? Why?

14 Response(s)

6. Why do you think consumers might be concerned about counterfeit wine?

14 Response(s)

Consumer Questionnaire

Full results – Consumer Questionnaire

Below are the full results downloaded from the online survey company Constant Contact for the Consumer Questionnaire. Results reported in the dissertation text have been adjusted to remove the ‘no response’ categories which comprises those respondents who entered the survey but did not answer any questions.

1. Please enter the information indicated below: (If you wish to remain anonymous, please leave out the First and Last Name fields but please complete City and Country details) (No information will be shared and no comments will be attributed to an individual).

First Name	35
Last Name	34
City	62
Country	63

2. Would you classify yourself as?

	Number of Response(s)	Response Ratio
A Serious wine collector	45	58.4%
A Casual wine collector	16	20.7%
An Occasional wine collector	5	6.4%
Not a wine collector at all	0	0.0%
Other	4	5.1%
No Responses	7	9.0%
Total	77	100%
10 Comment(s)		

3. When you purchase wine for collecting or investment, from which types of seller have you purchased wine in the past :

	Number of Response(s)	Response Ratio
Wine Producer Direct	53	68.8%
Retailer	65	84.4%
Private Seller	40	51.9%
Auction House	42	54.5%
Website	37	48.0%
Other	3	3.8%
Total	77	100%
3 Comment(s)		

4. To your knowledge, have you ever been offered or come into possession of a wine that is counterfeit?

	Number of Response(s)	Response Ratio
Yes	18	23.3%
No	52	67.5%
No Responses	7	9.0%
Total	77	100%
10 Comment(s)		

5. In your opinion, would you say there is more or less counterfeit wine in the market today than there was 10 years ago?

	Number of Response(s)	Response Ratio
More	41	53.2%
Less	3	3.8%
Same	5	6.4%
Don't Know	17	22.0%
No Responses	11	14.2%
Total	77	100%
10 Comment(s)		

6. Are you more worried or less worried about counterfeits when purchasing wine than you were 10 years ago?

	Number of Response(s)	Response Ratio
More	40	51.9%
Less	7	9.0%
Same	20	25.9%
No Responses	10	12.9%
Total	77	100%
4 Comment(s)		

7. Looking at the future, do you think that counterfeit wine will become a more serious issue for the wine world in the next 5-10 years?

	Number of Response(s)	Response Ratio
Yes (Please comment why below)	40	51.9%
No (Please comment why not below)	14	18.1%
Don't Know	12	15.5%
No Responses	11	14.2%
Total	77	100%
51 Comment(s)		

8. Of wines sold on the secondary market, what percentage would you estimate to be counterfeit? (Please enter an exact % estimate - no ranges please)

60 Response(s)

9. What impact do you think that counterfeiting of high-end wine has on the wine business in the following areas:

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Don't Know	No Impact	Very little Impact	Moderate Impact	Considerable Impact
Profitability	2 3%	6 10%	23 38%	21 35%	8 13%
Reputation	1 2%	3 5%	7 12%	28 47%	21 35%
Liability issues	5 8%	7 12%	16 27%	19 32%	13 22%
Ability to set prices	4 7%	12 20%	20 33%	15 25%	9 15%
Demand for rare/cult wines	3 5%	12 20%	17 28%	18 30%	10 17%

8 Comment(s)

10. In your estimate, what percentage of high-end wine producers do you think would use some kind of anti-fraud measures? (Please give an exact % estimate - No ranges please)

60 Response(s)

11. Do you think that wine companies take strong enough measures to prevent counterfeiting of wine?

	Number of Response(s)	Response Ratio
Yes	8	10.3%
No	43	55.8%
Don't Know	9	11.6%
No Responses	17	22.0%
Total	77	100%

14 Comment(s)

12. For long term cellaring (and potential resale), do you think you would be more likely to purchase a wine brand knowing they use anti-counterfeit technology?

	Number of Response(s)	Response Ratio
Yes	45	58.4%
No	11	14.2%
Don't Know	4	5.1%
No Responses	17	22.0%
Total	77	100%

8 Comment(s)

13. Are you aware of any specific anti-counterfeiting methods used by wineries, and if so what are they?

44 Response(s)

14. Would you like to see the issue of counterfeit wine become a more public issue?

	Number of Response(s)	Response Ratio
Yes (Please briefly comment why below)	42	54.5%
No (Please briefly comment why not below)	16	20.7%
No Responses	19	24.6%
Total	77	100%
44 Comment(s)		

15. How satisfied are you with the efforts to date by the wine industry as a whole to combat wine fraud?

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Very Unsatisfied	Somewhat Unsatisfied	Neither Satisfied or Unsatisfied	Somewhat Satisfied	Very Satisfied
	8	23	18	7	2
	14%	40%	31%	12%	3%
8 Comment(s)					

16. Would you like to see industry wide standards developed to help combat fraud?

	Number of Response(s)	Response Ratio
Yes	43	55.8%
No	8	10.3%
Don't Know	7	9.0%
No Responses	19	24.6%
Total	77	100%
8 Comment(s)		

17. Please rank the following in order of who you consider to be least to most responsible for combating fraud :

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Least Responsible				
	1	2	3	4	5
Producer	11 19%	5 9%	3 5%	5 9%	33 58%
Government	17 30%	14 25%	11 19%	9 16%	6 11%
Regional Bodies	4 7%	14 25%	25 44%	12 21%	2 4%
Consumers	9 16%	11 19%	9 16%	14 25%	14 25%
Police	16 28%	13 23%	9 16%	17 30%	2 4%
5 Comment(s)					

18. Does the issue of counterfeit wine enter into your decision making process when you buy high-end wine?

	Number of Response(s)	Response Ratio
Yes	31	40.2%
No	26	33.7%
No Responses	20	25.9%
Total	77	100%
15 Comment(s)		

19. Have you ever refused to purchase a wine because of lack of confidence surrounding authenticity with any of the following:

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Yes	No
Wine Brand / Producer	9 16%	47 84%
Retailer	18 32%	39 68%
Private Seller	28 50%	28 50%
Auction House	25 45%	31 55%
Website	25 45%	31 55%
6 Comment(s)		

20. For the following list, please rate whether you consider each of these scenarios as likely to cause an increase or decrease in the incidence of fraud in the future:

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.

	Significant Decrease	Some Decrease	No Change	Some Increase	Significant Increase
Rising wine prices at release	0 0%	2 4%	7 12%	19 33%	29 51%
Limited supply but increasing demand	0 0%	3 5%	4 7%	17 30%	33 58%
Prestige of top wines	0 0%	4 7%	6 11%	17 30%	30 53%
Anti-fraud labelling technology	19 33%	31 54%	4 7%	2 4%	1 2%
Anti-fraud technology that "fingerprints" wine for later comparison	18 32%	27 47%	10 18%	1 2%	1 2%
The long-term cellaring of top wines	0 0%	6 11%	30 53%	13 23%	8 14%
Increasing wine prices on the secondary market	0 0%	2 4%	7 12%	23 40%	25 44%
The difficulty in accurate tracking of distribution & consumption	0 0%	3 5%	16 28%	29 51%	9 16%
Rise of non-traditional markets (e.g. China)	1 2%	2 4%	5 9%	27 47%	22 39%

1 Comment(s)

21. Do you think that wineries are unwilling to publicly discuss the issue of counterfeit wine due to fears that a more public profile of fraud may have a negative impact on their business? (Please comment below)

56 Response(s)

22. Do you have any further comments you would like to make on the issue of counterfeit wine?

27 Response(s)

23. Would you be willing to be interviewed by phone to provide further details and opinions for the dissertation?

	Number of Response(s)	Response Ratio
Yes (Please enter preferred contact phone number and email below)	19	24.6%
No thank you	38	49.3%
No Responses	20	25.9%
Total	77	100%

20 Comment(s)

Interview Questions

Below is a list of the base questions asked in the interview process. These questions were answered either by email or through a phone interview.

Questions as Asked to the Wine Trade and Wine Experts

Master of Wine – Auction House/Merchant Interview Questions

Dissertation Background – Counterfeit Wine

The Dissertation is exploring the impact of counterfeit wine on the business of wine amongst producers, consumers and those involved with the fine wine business. The context of this dissertation is high-end/cult wines and counterfeit where the wine in the bottle does not match the label under which it is being sold.

Questions

- Q. What do you estimate is the total value of the Fine Wine market? (in US dollars)
- Q. What do you estimate is the total value of the counterfeit wine market? (in US dollars)
- Q. Is counterfeit wine an issue to buyers and sellers of wine at auction? Why?
- Q. Is counterfeit wine impacting your business success? How?
- Q. Is counterfeit wine likely to increase or decrease in the next 10 years? Why?
- Q. How many cases have you seen of counterfeit or suspicious wine? What percentage, if any, of the lots you get are suspicious or counterfeit?
- Q. What methods are you using to combat counterfeit wine?

Questions as Asked to Anti-Fraud Companies

Master of Wine Interview Questions

Dissertation Background – Counterfeit Wine

The Dissertation is exploring the perceptions of wine fraud amongst producers, consumers and those involved with the fine wine business. The context of this dissertation is high-end/cult wines and counterfeit where the wine in the bottle does not match the label under which it is being sold.

Questions

- Q. What are your views on the prevalence of wine fraud? Has it increased or decreased?
- Q. Do you see the issue of counterfeit wine becoming more important in the future and why?
- Q. Is there a strong economic impact from fraud of cult wines? Who does it impact the most?
- Q. Is there enough being done to combat counterfeit wine? Who should be responsible for this?
- Q. It seems that some want to openly address the issue of fraud and others want to sweep it under the rug. Do you think that wine producers have the right attitude to fraud? Should it be a more public issue?
- Q. Do you think the issue of counterfeit wine impacts purchase decisions amongst consumers? Why?
- Q. Are you aware of other methods out there that could potentially help reducing the incidence of counterfeit wine?

Descriptions of Anti-Fraud Technology

Prooftag

Prooftag uses a square of plastic gel that has a unique pattern called a “Bubble Tag” that runs between a bottle’s capsule and neck. Customers can read the code and enter it on a website where they can compare the bubble pattern against a picture of the original. The costs range from €0.2-0.5 per bottle.

Kodak

Eastman Kodak has developed an anti-counterfeiting labeling technology that uses invisible markers that can be added to packaging (ink, labels, paper, and capsules) and that are detectable with only a proprietary handheld scanner/reader. Readers are leased to customers. Gannon (2008) reports costs at approximately USD\$1 per bottle.

eProvenance

Attaches a neck seal to the bottle during labeling as well as a bottle tag in the punt and incorporates RFID (Radio Frequency Identification). This allows not only tracking of all bottles but also monitoring of temperature during transport. A scanner can be used to get information on a separate phosphorus-based code. This technology came about in consultation with Corinne Mentzelopoulos of Château Margaux to help track what happens to a wine once it leaves the Château (Gannon, 2008). Costs are reported at USD\$10,000 to set up the equipment, about USD\$22 per case for sensors and punt tags and neck seals are less than USD\$1 per bottle. There is also a USD\$1,000 monthly subscription to the on-line database.

Applied DNA Sciences

Applied DNA Sciences offers two anti-counterfeiting technologies – SigNature DNA markers and BioMaterial Genotyping. SigNature DNA embeds DNA into paper, glue, holograms or ink used on bottles or corks that can be tested later for authenticity. BioMaterial Genotyping takes ‘fingerprints’ of specific wines for later comparison.

CertiLogo (Did not respond to email or phone interview requests)

CertiLogo uses algorithms to produce special numeric codes that can be placed on different parts of the packaging, in holograms or Radio Frequency Identification (RFID) tags. Customers can log onto the website for information about the bottle.

Collotype Labels

Developed a DNA encoded label, DNA SmartMark for BRL Hardy's Eileen Hardy Shiraz. The labels incorporate encrypted sections of DNA and invisible spectral signature markers that are read by a handheld scanner. The SmartMark is printed on a tamper proof neck label that seals the bottle and prevents replacement of capsule and cork. During the interview process, Collotype commented they are no longer pursuing the wine industry for clients and no clients are currently using their technology.

iProof (Did not respond to email or phone interview requests)

The system is reported to use RFID and provides the ability for customers to access information about the product on-line or via text message. The database includes the wine's intended destination.

Argonne Cap

Developed in the USA, it places a cap over the cork of a bottle. The cap contains a circuit that, when the bottle is opened, triggers an electronic pulse that creates evidence of tampering or that the bottle was opened. This allows the bottle to be checked prior to sale (US Fed News, 2008). The cost is reported at 'a few dollars per bottle, plus 50c for web page and programming of device.'

Vincert (Did not respond to email or phone interview requests)

Vincert is the commercial application of the methods created by Philippe Hubert and colleagues. Vincert measures X-ray radiation when a bottle is put in front of an ion particle beam, and also measures the chemical composition of the glass. This can be compared against a database of Cesium 137 levels in the atmosphere and components of glass and allows detection of how old the glass and wine is and where it was made (Tzabar, 2008).

Advanced Technologies for Combating Fraud

Various levels of advanced technology are being developed that can help to prove a wines authenticity. Many of these technologies are reliable but expensive and have a long processing time. They include liquid-chromatography, mass spectrometry (MS), nuclear magnetic resonance (NMR) and spectrophotometry (Penza & Cassano, 2004), and chemical analysis of particular species and stable isotope controls (Parra, et al., 2006).

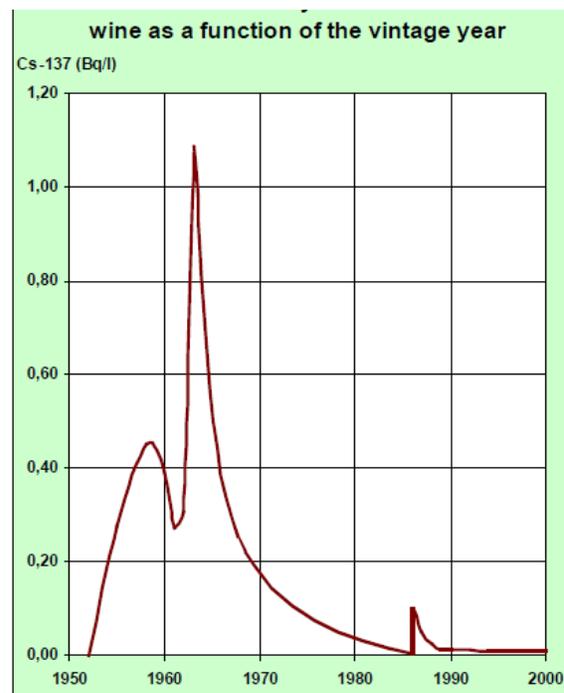
Smith (2009) writes about researchers in Western Australia who are using chemical ‘fingerprinting’ of wines to build a database for comparing trace elements in a wine and linking it back to a specific terroir.

Popping (2002), highlights the use of DNA technology to protect both brand names and the consumer. This is an example of what was previously a high-end laboratory technology now becoming increasingly used in the main stream (Popping, 2002). Stewart (2007) reports: ‘The Australian wine distributor BRL Hardy is impregnating DNA from vineyards into the printing ink of neck labels. Hand-held scanners can then read the "brand."’

Professeur Philippe Hubert of the Centre d'Etudes Nucleaires de Bordeaux-Gradignan has been working on methods to vintage date a wine without, importantly, having to open the bottle and destroy the valuable product. Methods rely on the fallout of atmospheric nuclear events (tests, Chernobyl, etc.) that have resulted in radioactive chemicals being present in the atmosphere. The technique measures the chemical cesium 137. This chemical allows pinpointing of specific vintages since 1952. The ^{137}Cs curve (Figure 17) can be used as a reference from any vintage since 1952, and as a benchmark for vintages prior to 1952 in that they will inevitably be very low in cesium 137.

Hubert (2009), states that ‘all wines after 1952 must contain some amount of ^{137}Cs radioactivity.’ While not being all conclusive, this allows us to at least

Figure 17: Levels of ^{137}Cs in Bordeaux (Hubert 2007)



confirm whether the wine is pre or post 1952. When ^{137}Cs decay they emit a gamma ray of 661keV that can, importantly, be detected through the glass. ‘If we do not see any 661keV line, we can just say the “millesime” is before 1952. We cannot say if the bottle is fake or authentic,’ Hubert (2009). The problem re-occurs in 1990 when ‘the level of ^{137}Cs becomes rather weak, and our sensitivity is not enough to see again the gamma line’ (Hubert, 2009).

The CENBG is also authenticating the glass of bottles by ion beams. The Centre of Nuclear Studies of the University of Bordeaux is working with The Antique Wine Company to validate wine without opening the bottles. The company Vincert (page 64) is the commercial offshoot of this technology (CENBG, 2008).

Connor (2008) mentions the potential for technology such as the electronic tongue that has already been calibrated to be able to distinguish between some grape varieties. The hope is that this may become a vehicle in determining counterfeit bottles in the future.

Many other new technologies involve preventing, rather than detecting, fraud, often protecting the label or other parts of the packaging from counterfeiting. Techniques include holograms, special inks, invisible markers, patterns that cannot be replicated and special codes printed on the label (Spivak, 2008).

Companies commercially offering products include Prooftag, Kodak Eastman, eProvenance, Applied DNA Sciences, CertiLogo, Collotype Labels, iProof and Argonne Cap. Further details on these technologies have been included in the Appendix (page 65).

These recent efforts by the scientific community and commercial companies reflect the increased focus being placed on the issue of counterfeit wine and associated business opportunities. There is the potential to create a new field of business with the wine industry in both protecting against and detecting counterfeit wines.

More details on other technologies are shown below.

Fingerprinting

Researchers in Western Australia are using chemical ‘fingerprinting’ to build a database for comparing trace elements in a wine linked to a specific place. The ‘fingerprint’ is based on the concentration of over 60 trace elements that change based on terroir. The goal is to then build up a database of wines from

around the world. Eventually an unknown wine will be able to be compared against the database to determine the wine's origin. Whether or not this 'fingerprint' changes as wine matures might render this technique worthless and just cause more confusion than providing any real solution (Smith, 2009)

This same technology is potentially useful for testing of authenticity of wines during transport and distribution. A wine 'fingerprinting' system using mid-infrared (MIR) spectrum to compare wines to a similarity index may be useful in determining authenticity. This technology could be extremely beneficial for a rapid and affordable means to test authenticity (Bevin, et al., 2006).

DNA Technology

This helps to prevent one of the most common forms of counterfeiting wine, by reproducing a label and placing it on a bottle containing an inferior product. If complaints or questions of authenticity arise, companies can simply test the packaging without damaging the seal and the product inside (Popping, 2002) (Stewart, 2007). This technology is being used by Collotype Labels and Applied DNA Sciences (see Appendix page 63).

Nuclear Technology

A recent technique developed by Philippe Hubert of Centre d'Etudes Nucleaires de Bordeaux-Gradignan (CENBG) relies on radioactive fallout to determine vintage authenticity. Certain chemicals were present in the atmosphere in different levels depending on the year. The particular chemical measured is cesium 137. This chemical allows pinpointing of specific vintages since 1952. The ^{137}Cs curve (Figure 17) can be used as a reference from any vintage since 1952, and as a benchmark for vintages prior to 1952 in that they will inevitably be very low in cesium 137. For cases when the ^{137}Cs curve is not decisive, other radioactive isotopes can be used. (Centre d'Etudes Nucleaires de Bordeaux Gradignan (CENBG), 2008).

Hubert (2009), states that 'all wines after 1952 must contain some amount of ^{137}Cs radioactivity.' While not being all conclusive, this allows to at least confirm whether the wine is pre or post 1952. When ^{137}Cs decay they emit a gamma ray of 661keV that can, importantly, be detected through the glass. 'If we do not see any 661keV line, we can just say the "millesime" is before 1952. We cannot say if the bottle is fake or authentic,' Hubert (2009). The problem re-occurs in 1990 when, Hubert (2009) reports, 'the level of ^{137}Cs becomes rather weak, and our sensitivity is not enough to see again the gamma line at 661 keV.'

Beyond proving wines are older than 1952, any engravings can be analyzed for the method used to make the engravings.

A very recent technique, also from the CENBG, involves authenticating the glass of bottles by ion beams. The Centre of Nuclear Studies of the University of Bordeaux is working with The Antique Wine Company to validate wine without opening the bottles. This allows for the testing of authenticity of the wines the company is selling as well as the ability to offer the service to collectors. The analysis of the glass compares information to a database that has been built from authentic bottles from Bordeaux Châteaux. The components used in glass manufacturing have gradually changed over the years providing a form of database of ingredients for comparison (CENBG, 2008). The advantage of this technology is that it can help determine authenticity without sacrificing the product in the process.

Electronic Nose & Tongue

The electronic nose and tongue devices analyze complex mixes of liquids or gases coupled with pattern recognition software and have been found to discriminate between different quality levels, types of oak and grape varieties (Parra, et al., 2006). The fact that these devices operate based on what chemical species are in the tested liquid shows that there is also the potential to isolate fraudulent additives or lesser quality wines.

Stable Isotope Analyses

Stable isotope analyses can help identify the addition of sugar or water. Illegally adding sugar or water is usually not in the realm of serious counterfeiting, but it is possible that counterfeit wines may have been subject to these manipulations and therefore the techniques could be somewhat useful in detecting fraudulent wines. These analyses also have some application in identifying origin although this becomes blurred when grape variety, harvest date and vintage variation are included. There is the potential for identifying authenticity of origin when a database of values based on region and vintage has been put in place but the closer the regions climatically, the less accurate the results (Ogrinc, et al., 2001).

Further Insights into Emerging Markets

There is significant writing on the issue of fraud and emerging markets so additional information has been included here in the Appendix.

Coffey (2006) discusses the problem. ‘In recent years authorities in China have uncovered bottles of fake everything, from a \$4,000 bottle of Château Lafite Rothschild to 12,000 bottles of \$10 Mouton Cadet. Of particular interest of late have been Canadian icewines, which are relatively scarce and highly coveted in Asia.’

Wright (2006), not speaking specifically about wine but counterfeiting in general, states that ‘there are entire countries in many parts of the world where the piracy rates are so astronomical that doing business is virtually impossible. Plenty of people consume our products, but it is all stolen property.’ If wine producers want to expand their business into these emerging markets then they will have to deal with these issues. International cooperation will be essential to fight counterfeit fraud.

Coffey (2006) furthers the issue with the Chinese market. ‘If rumours are believed, it's a big problem that even includes a black market in Guangzhou for empty Bordeaux bottles counterfeiters refill and pass off as genuine.’

Other markets also seem to be at high risk for fraud. Just-drinks.com (2006) reports that 9 out of 10 bottles of Georgian wine may be fake. Agence France Presse (2006) highlights a growing problem in Vietnam, particularly with prestigious Bordeaux.

The rapidly expanding upper classes in these markets, and the need for the wealthy to fit in to the global ideals of social status, are likely to create significant demand for cult wines. These newer markets, without a long history of wine consumption, may be satisfied simply with the possession of a label and the status it brings, rather than to be worried about the specific contents of the bottle and whether or not it is authentic.

Fighting fraud can take away from time and funds that could be used to promote wines. Dorozynski (2009, pers comm.) states: ‘Rather than focusing market development efforts on promotion of icewine, a fair bit of time is spent (in particular by our Embassies in these countries) on discussing and organizing events which focus on distinguishing fake products from authentic icewine for trade and media in these

markets. Not to mention discussions with the governments of these countries on how to prevent these products from being labeled as Canadian icewine.’

Coffey (2006), quoting a Shanghai importer of wines, seems to even suggest that government owned wineries may be involved in counterfeit activities. ‘we need to keep up good relations with the government, and as the government owns some of these wineries, we cannot be seen as criticizing them.’

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