

COUNTERFEITING IN THE WINES AND SPIRITS MARKET

KEY ISSUES AND PRESENTATION OF ANTI-COUNTERFEITING
TECHNOLOGIES



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Introduction

The wines and spirits industry did not wait for globalization and the growing power of China to discover the charms of the fake and the illicit, but it is true to say that, excluding the specific case of experts (i.e. Rudy Kurniawan) and the international negotiations on controlled designations of origin, the problem of counterfeiting is emerging with renewed intensity for the sector. The counterfeiters, often from Asia, really do exist and some spirits are a potential hazard for public health.

The object of this research study is not to provide an exhaustive account of such a phenomenon, but to provide an initial insight into the best, albeit limited, sources available on the subject. It also aims to provide an informative view of the technologies present on the market and to highlight in particular the strategic importance and underestimation of digitization as well as the importance of the consumer in security devices.

In the first instance, we shall describe certain contextual aspects associated with the counterfeiting of wines and spirits, and then we shall illustrate the phenomenon on the basis of some targeted regions. In the second part we shall present a typology of anti-counterfeiting technologies and their characteristics. Finally, the report ends by presenting the basic trends in anti-counterfeiting technologies, which those involved in the sector will need to consider.

I. General environment and counterfeiting on the wines and spirits market.

I.1. Alcohol counterfeiting market

I.1.a. Context

- Illicit markets are traditionally difficult to analyze, but the alcohol case is particularly revealing.
- There are no international statistics on customs seizures of illegal alcohol. Regional statistics are furthermore often difficult to obtain, but the WCO seems to be working on improving its evaluation of the phenomenon in terms of seizures¹. Wines and spirits are generally included in the “food and beverage” category in most countries concerned (particularly the US and France). This situation may be explained at the same time by:
 - the relative weighting of wines and spirits compared to other economic sectors,
 - the great variety of foods and drinks involved which would require a wide segmentation in order to evaluate seizures of high-end wines, for example.
 - the fact that counterfeit wines and spirits can be manufactured mainly locally for local consumption (such as China or Russia, for example) and therefore do not all transit across different territories.

→ This lack of analysis is even more marked on the internet, where there is no openly available information at all on the distribution of counterfeit alcohol over the internet.

→ This situation means that the statistics and analyses circulating on the phenomenon are based on estimates.

→ This is the case with China, the focal country in the trafficking, where the corruption aspect also needs to be taken into account in the analyses, and where statistics are often open to question.

Accuracy:

Generally speaking, as in any analysis of illicit trade, the statistics or data should be used with caution and especially in regions or countries covering a large area. Some studies provide credible figures on the target zones using clear methodologies: this is particularly true in the case of the PwC study in the UK.

Other figures produced by official organizations will be communicated, but it is important to validate their methodology.

¹ Interview with Benoît Goyen, World Customs Organization

I.1.b. A sensitive definition

Rather than “counterfeiting”, it clearly makes sense to talk instead of the illicit market by distinguishing between the different categories covered by this multifaceted concept.²

- **Counterfeiting and illegal brands:** illegal alcohol sold as a lawful brand or branded bottles emptied and refilled with cheap alcohol. Illegal alcohol manufacture (branded or unbranded).
- **Contraband:** illegal importation of alcoholic beverages or raw materials such as ethanol.
- **Illegal craft production:** illegal craft production of alcoholic beverages for commercial purposes.
- **Substitution:** alcohol that is not intended for human consumption (e.g. pharmaceutical alcohol) redirected to the alcoholic drinks market.
- **Tax leakage:** legal alcoholic beverages produced locally, on which no taxes are paid.

More specifically, the OECD³ considers that an illicit trade in alcohol is based on three premises:

- counterfeiting of products,
- products that generate a fiscal loss,
- products that are unfit for consumption.

I.2. Global vision

I.2.a. The Chinese case

A growing burden on the wine market

- Even though 120 countries produce wine, only about 15 or so countries play a significant role in the globalization of wine.⁴
- The emergence of China on the international wine scene, as producer, importer and consumer, has been accelerating for some years. In 2011 the country’s wine-growing area was the fourth largest in the world and it is continuing to increase the size of its vineyards.⁵

² Source: Euromonitor International, *Illegal Alcohol: Trends & Challenges*, October 2013.

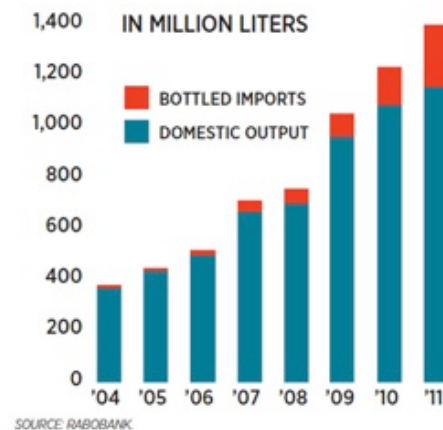
³ OECD Task Force on Charting Illicit Trade (TF-CIT), Sub-Group on Alcoholic Beverages *Stakeholders’ contribution to the Assessment of the Size, Impacts and Drivers of Illicit Trade in Alcohol*, February 2014, p. 3.

⁴ Stéphane Dubois, “Lecture géopolitique d’un produit alimentaire mondialisé: le vin” [Geopolitical reading of a globalized food product: wine], *Revue internationale et stratégique* 1/ 2013 (no. 89), p. 22.

⁵ *Ibidem*, p. 26.

- China is the fifth largest consumer of wine in the world⁶ and has become for the first time the biggest consumer of red wine, ahead of France and Italy.⁷
- A recent study by Vinexpo also shows that China and Hong Kong have become the world's second largest market globally for the most expensive wines.⁸

POUR IT ON
CHINA'S WINE MARKET, ALREADY
THE WORLD'S FIFTH LARGEST,
GREW BY 14% LAST YEAR.



- Between 2012 and 2016, Chinese wine consumption is expected to increase by 40% to 858 million bottles, which will make it the fastest-growing market ahead of the US and Russia.⁹
- China is developing local wines with great vitality; some of its wines have very few technical faults and are improving in quality.¹⁰

A special relationship with France:

- An interesting sign of the increasing range of Chinese wines: LVMH is attempting to become established in the Yunnan province and Rothschild is planning to start production in Shandong in 2015.¹¹
- France focuses its wine export sales on the three largest markets in terms of consumption: the UK, the US and China. Yet a special feature of French exports to the Middle Kingdom is that they have grown exponentially, with wine exports having increased by 3,700 % since 2001.¹²

⁶ Josh Bateman, "How education is driving China's unquenchable thirst for wine", *Asian Correspondant*, 17 January 2014.

⁷ Scheherazade Daneshkhu, "China overtakes France as biggest consumer of red wine", *Financial Times*, 29 January 2014.

⁸ Rupert Millar, "Vinexpo Asia Pacific: Hong Kong goes global", *The Drink Business*, 7 May 2014. <http://www.thedrinksbusiness.com/2014/05/vinexpo-asia-pacific-hong-kong-goes-global/?article-source=newsletter&source=869&date=2014-05-06>

⁹ IWSR quoted by Josh Bateman, "How education is driving China's unquenchable thirst for wine", *Asian Correspondant*, 17 January 2014.

¹⁰ Bernard Burtschy, "La Chine à l'âge de raison" [China in the age of reason], *lefigaro.fr*, 24 April 2014.

¹¹ Stéphane Dubois, "Lecture géopolitique d'un produit alimentaire mondialisé: le vin" [Geopolitical reading of a globalized food product: wine], *Revue internationale et stratégique* 1/ 2013 (n° 89), p. 26.

¹² *Ibidem*, p. 9.

- China has become the leading export market for Bordeaux wines.¹³
- France accounts for half of European wine exports to China (with an overall value of one billion dollars).¹⁴
- France enjoys a strong brand image and remains the primary market associated with the luxury sector for 35% of Chinese consumers.¹⁵ The great French vintages and cognac, extremely popular in China, likewise benefit from this positioning.
- Sales of cognac represented 27 million liters in 2012 (compared to 21 million liters for whiskey), i.e. double the figure for 2007.¹⁶

Key issues involved in counterfeiting

- According to César Compadre, specialist reporter for the newspaper *Sud-Ouest*¹⁷, China has featured on the counterfeit market particularly in the last 4-5 years, but is of central significance for this illicit trade and the counterfeit alcohol is destined mainly for the local market. For the French exports, the main targets are Bordeaux reds and cognac, with champagne and white wines being of marginal interest.
- The market share of counterfeit imported European spirits is thought to be around 25% in China.¹⁸
- The counterfeiters tend to favor high-end European wines.¹⁹ However, the growing appeal of American wines for the Chinese could cause the focus of counterfeiting to be partially redirected toward certain target wines, particularly those from the Napa region. China is actually the fifth-largest export market for Californian wine and sales there increased by 20% in 2012.²⁰ This type of wine also lends itself very well to Oriental cuisine and could benefit from the strong image of California among many Chinese.²¹
- China is investing considerable resources to combat the problem of food and drink safety: 60,000 individuals were detained in 2013 in the course of these investigations.²²
- Yet the statistics on counterfeiting in China remain fragmented and the Chinese organizations in charge of this problem are not always very well coordinated. The very recent creation of the *Food and Crime Investigation Bureau* based in Beijing could enable Chinese inspectors to be given more effective means of enforcement.²³

¹³ Interview with César Compadre.

¹⁴ Terril Yue Jones, "Chinese counterfeiters target European wines", *Reuters*, 9 June 2013.

¹⁵ KPMG, *Luxury experiences in China*, April 2011.

¹⁶ Patti Waldmeir and Duncan Robinson, Cnbc, quoted by *China Beverage News*, "China crackdown threatens global cognac industry", 20 April 2014.

¹⁷ Interview with César Compadre.

¹⁸ Spirits Europe, http://www.spirits.eu/page.php?id=80&parent_id=30

¹⁹ Napa Valley Vintners, "Crash Course on Counterfeit Protection for the Wine Industry", *Press Release*, 24 July 2013.

http://napavintners.com/press/press_release_detail.asp?ID_News=400121

²⁰ Ritula Shah, "China's growing interest in Californian wine", *BBC News*, 1 October 2013.

<http://www.bbc.com/news/business-24333860>

²¹ Virginia Harrison, "Californian Wines: China's latest crush", *CNN Money*, 11 November 2011.

<http://money.cnn.com/2013/11/08/news/china-wine-tastes/>

²² Stephen Chen, "Chinese task force to target counterfeit food and drugs", *South China Morning Post*, 30 March 2014, <http://www.scmp.com/news/china/article/1460655/chinese-task-force-target-counterfeit-food-and-drugs>

²³ *Ibidem*.

Chinese market and consumption

A recent article by the WHO²⁴ summed up the risks associated with alcohol consumption and confirmed that 55.6% of men and 15% of women in China consume alcohol. However, the article stresses the lack of Chinese statistics in terms of impact on public health. Counterfeiting and alcohol trafficking also comes into this category. Faced with statistics that are limited, to say the least, action on the ground currently remains the best solution to attempt to address the problem.

- Nick Bartman²⁵, an expert based in China, saw almost 400 different wines in seven Chinese regions during a five-week stay in 2010: approximately 50% of the foreign wine he saw was fake.
- By comparing production in France and retail sales in China, the oenologist Frankie Zhao estimates that 70% of Château Lafite Rothschild bottles sold in China are fake.²⁶ The lawyer Antoine Chéron estimates that 60% of wine that is sold in China as French is fake²⁷. However, it is wise to treat these statistics with caution, as they remain subjective estimates that have not been validated by a statistical tool.
- According to Wine Intelligence, wine counterfeiting was one of the five main trends in the Chinese market in 2013.²⁸

Another relevant trend revealed by the same firm: 44% of Chinese consumers do not know whether or not the wine they are drinking is authentic.²⁹ This factor significantly undermines consumption of the most prestigious imported wines and represents a strong barrier to purchase.

²⁴ Yi-lang Tang *et al.*, “Alcohol and alcohol-related harm in China: policy changes needed”, *Bull. World Health Org.*, vol. 91, 2013, p. 270-276.

²⁵ Jim Boyce, *Matured two years: Nick Bartman’s investigation of fake wine, other IPR issues in China*, 3 June 2012, <http://www.grapewallofchina.com/2012/06/03/matured-two-years-nick-bartmans-investigation-of-fake-wine-other-ipr-issues-in-china/>

²⁶ http://french.china.org.cn/business/txt/2011-12/05/content_24079033.htm

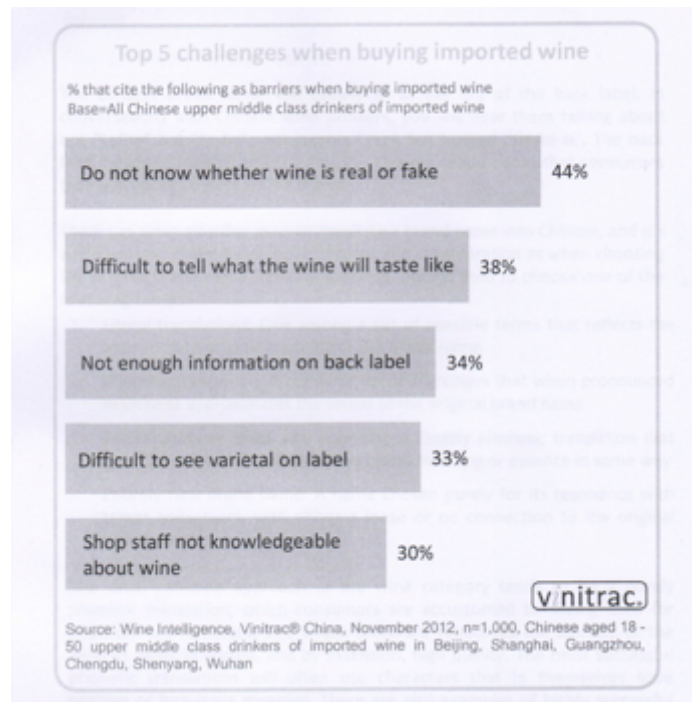
²⁷ Antoine Chéron, “La protection et la contrefaçon de vins en France et à l’étranger” [The protection and counterfeiting of wine in France and abroad], *Le Journal du Net*, 28 June 2013.

<http://www.journaldunet.com/economie/expert/54644/la-protection-et-la-contrefacon-de-vins-en-france-et-a-l-etranger.shtml>

²⁸ China: Five trends for the wine market in 2013.

<http://www.wineintelligence.com/china-five-trends-for-the-wine-market-in-2013/>

²⁹ Wine Intelligence, *Is your back label right for China ?*, 27 June 2013, p. 2.

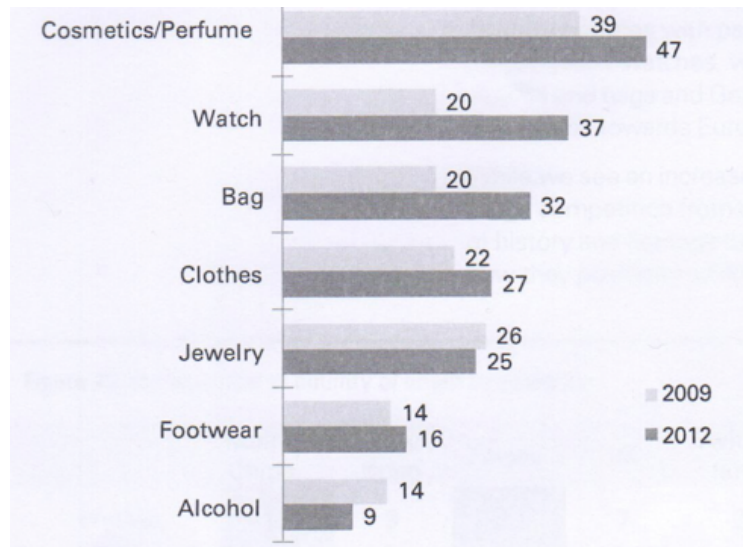


42% of Chinese consumers also insist that information about the wine's region of origin should be present on the back label, along with taste description (39%) and information on the producer (36%).³⁰

³⁰ *Ibidem*, p. 4.

Developments in the Chinese market

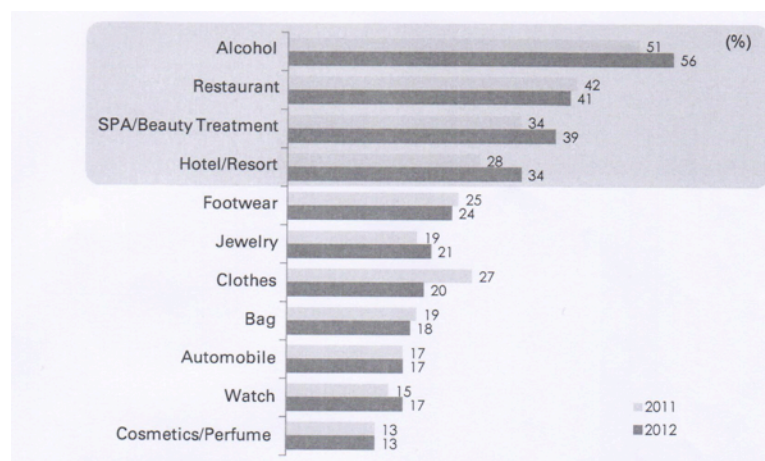
Purchase of foreign luxury products³¹



Although we can see an increase in the proportion of foreign alcohol purchased between 2009 and 2012, the phenomenon has probably lessened under the impact of the anti-corruption measures initiated by the Chinese president Xi Jinping.³²

On the other hand, when it comes to establishing the areas in which luxury brands are going to emerge in China next, alcohol appears to be a leading sector³³. We might therefore suppose that this trend favors an even more intense local anti-counterfeiting campaign, since it involves high-end Chinese brands.

According to Jean-Baptiste Thial de Bordenave from the consultancy Inlex, it is highly likely, in the medium term, that China will catch up when it comes to intellectual property rights to wines/spirits and that this will therefore benefit the market overall.



³¹ KPMG, TNS, *Global Reach of China Luxury*, 2013, p. 9.

³² Interview with César Compadre, journal Sud-Ouest, March 2013.

³³ KPMG, TNS, *Global Reach of China Luxury*, 2013, p. 38.

I.2.b. Global

Some trends are emerging on the global scale.

Percentage of illegal alcohol on some markets abroad³⁴

- Mediterranean (East): 56.2 %.³⁵
- South-East Asia: 69 %.³⁶
- Russia: 35-50%.³⁷
The market for counterfeit whiskey in Russia is estimated to be 166 million euros.³⁸
- Tanzania: 66%.³⁹

According to the *International Center for Alcohol Policies*, 30% of alcohol consumed worldwide is illicit⁴⁰ and experts from *Wine Spectator* estimate that 20% of the wine consumed worldwide is counterfeit.⁴¹

Credible statistics on the subject are rare but we were able to find three studies which enable us to paint a clearer and more credible picture of counterfeiting in wines or spirits in the UK, Italy and Latin America.

³⁴ These selected statistics are more difficult to validate than those from the previous reports.

³⁵ World Health Organization (2011), *Global status report on alcohol and health*: Geneva: WHO, p. 5.

³⁶ *Ibidem*.

³⁷ Amy Hopkins, "Russia's counterfeit whisky market worth £230m", *The Business Spirit*, 10 February 2014, <http://www.thespiritsbusiness.com/2014/02/russias-counterfeit-whiskey-market-worth-230m/>

³⁸ Source: State Statistics Russia, "Russians Drank 10m Liters of Counterfeit Whiskey in 2013", *RiaNovosti*, 8 February 2014, <http://en.ria.ru/business/20140208/187332759/Russians-Drank-10m-Liters-of-Counterfeit-Whiskey-in-2013.html>

³⁹ Source: Renaissance Capital quoted by Eleanor Whitehead, "Tapping into growth", *This is Africa*, 15 November 2011. <http://www.thisisafricaonline.com/Business/Brewers-tapping-into-African-growth>

⁴⁰ Alan Rappeport, Jan Cienski, Counterfeit alcohol problem takes a deadly toll, *Financial Times*, 5 November 2012.

⁴¹ Robert Taylor, *Wine Spectator*, 21 November 2013.

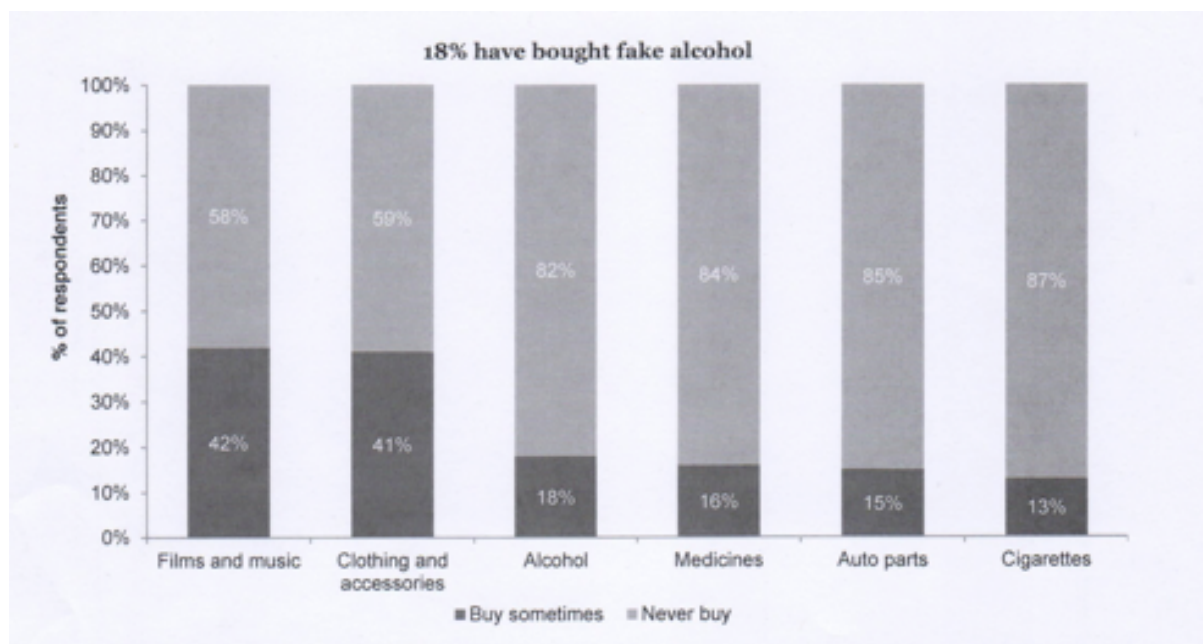
I.2.c. Alcohol: the UK case.

Significant sales of illicit alcohol

Between September and December 2011, the Central England Trading Standards Authority (CEntSA) and local business organizations visited 879 premises in the Midlands (half of them in the county of Staffordshire) and identified that **25% of sales of alcohol were illegal**, to the value of 180,000 euros.⁴² One of the keys to this operation's success is the sharing of information between the different institutions involved and the publication of the *Counterfeit Alcoholic Products Guide* in cooperation with The International Federation of Spirits Producers UK (IFSPUK).

Significant consumption of illicit alcohol.

18 % of respondents interviewed in a British survey conducted in 2013 by PWC⁴³ admitted to having purchased counterfeit alcohol (compared to 16% for medicines and 41% for clothing/accessories).



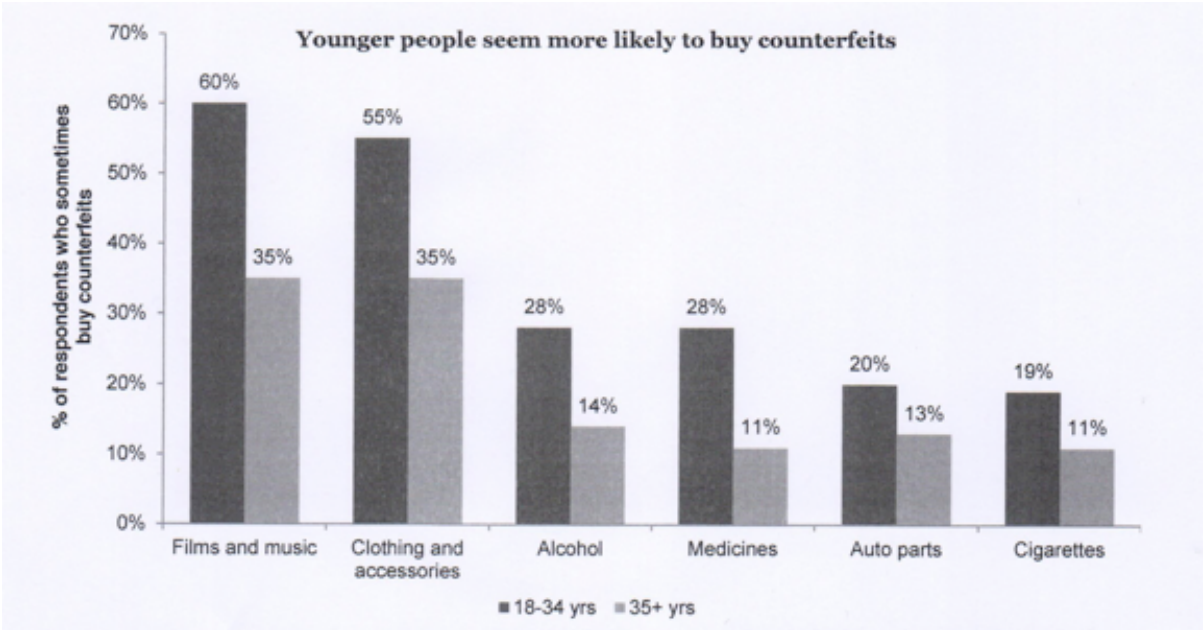
The most frequently counterfeited alcohol brands in the UK⁴⁴ are reported to be the vodka brands Smirnoff, Glen's and Selekt, whiskey brands Teacher's and High Commissioner, and Bacardi rum. In terms of wine, Blossom Hill and Jacob's Creek were also mentioned.

⁴² Source : IP Crime, *Annual Report 2011-2012*, p. 24.

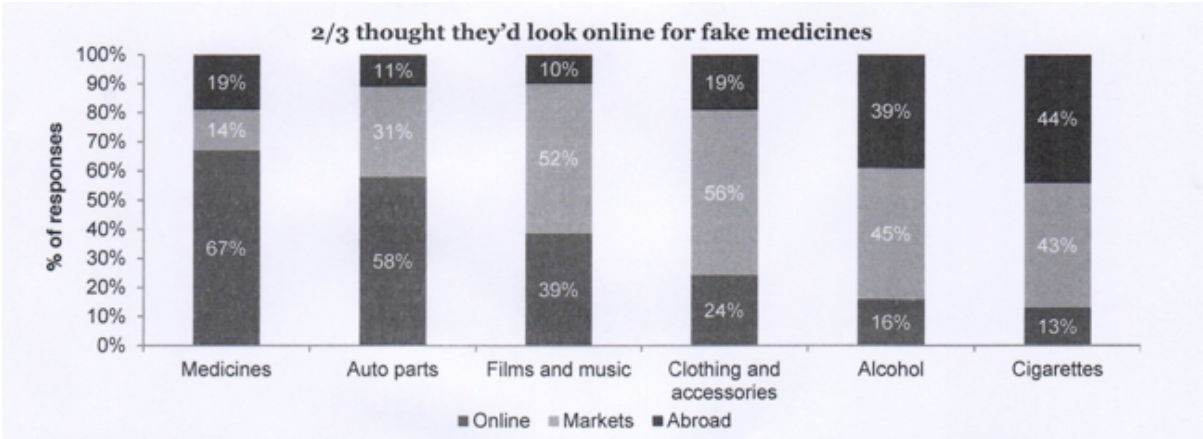
⁴³ PwC, *Counterfeit goods in the UK, Who is buying what?* October 2013, p. 2.

⁴⁴ Jack Desmond, « Alcohol Fraud- it's more common than you think », *Netnames Blog*, février 2014. <http://www.netnames.com/blog/2014/02/alcohol-fraud/>

A worrying problem: 28% of persons aged 18-34 are likely to buy counterfeit alcohol compared to 14% of persons aged 35 or over.⁴⁵



Consumption via the internet⁴⁶ seems to be a little-used strategy for alcohol since only 16% of respondents said they would purchase it online compared to 67% for medicines.



⁴⁵ PwC, *Counterfeit goods in the UK, Who is buying what?* October 2013, p. 3.

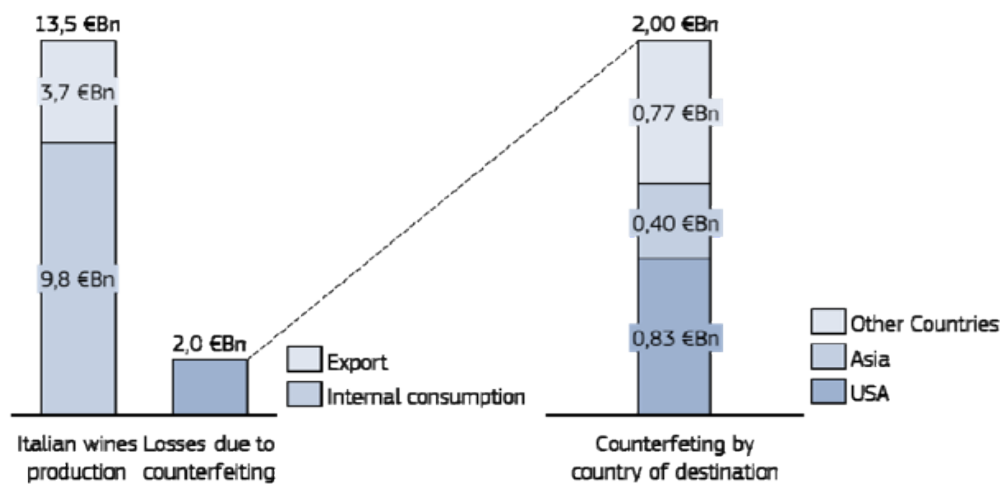
⁴⁶ *Ibidem*, p. 12.

I.2.d. Wine: the case of Italy.

In Italy, a research study conducted by Marco Turchini, then researcher at the University of Florence⁴⁷, highlighted the significance of the impact of counterfeiting on local production. The loss of revenue associated with the counterfeiting of Italian wines is reported to be two billion euros primarily intended for export.

Impact of counterfeiting

Impact of counterfeiting on the Italian wine industry and breakdown of destinations for counterfeit wine by geographical area.⁴⁸



Markets for Italian counterfeit wines

The primary international market targeted by this traffic is the American market. According to Marco Turchini, the importance of the United States in the Italian counterfeit wine trade could be explained by the fact that this country is the leading consumption region of Italian wine in terms of value. A second explanation is that prices for Italian wine are quite high in the US and demand therefore exceeds supply, and this consequently encourages the trade in counterfeit wines, which are sold for lower prices.

In the United States there is an important kind of brand counterfeiting which does not involve copying a well-known brand, but rather creating a false brand under an Italian controlled designation of origin and guarantee⁴⁹ (e.g. Brunello). The counterfeiting of Italian brands targeting the US comes mainly from Europe, Asia and Latin America. To a lesser

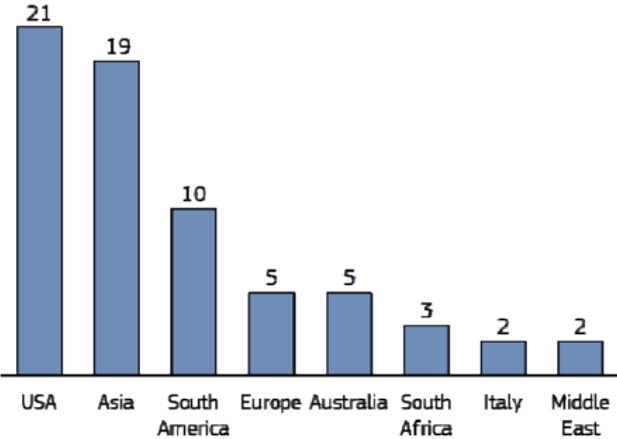
⁴⁷ Marco Turchini, *Averting counterfeiting in the wine industry: a supply chain-based framework*, Università degli Studi di Firenze, January 2012. For statistical purposes, 300 Italian businesses were contacted as part of this study and asked to complete a detailed questionnaire. Around 70 questionnaires were evaluated, with a majority of responses coming from wine producers in Tuscany (13).

⁴⁸ *Ibidem*, p. 8.

⁴⁹ DOCG. Vino a denominazione di origine controllata e garantita.

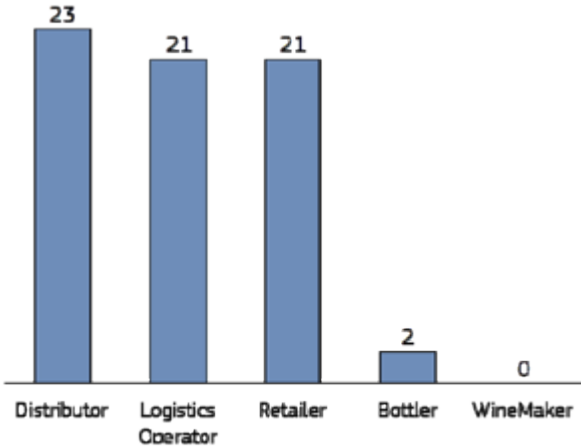
extent, the United States are also reported to shelter the counterfeiting of local Italian wines and/or Italian-related wines.

The most attractive countries for the trade in counterfeit Italian wine (by number of responses).⁵⁰



Distribution chain

The central axes in the distribution chain for counterfeit wine (by number of responses and as perceived by the respondents).⁵¹

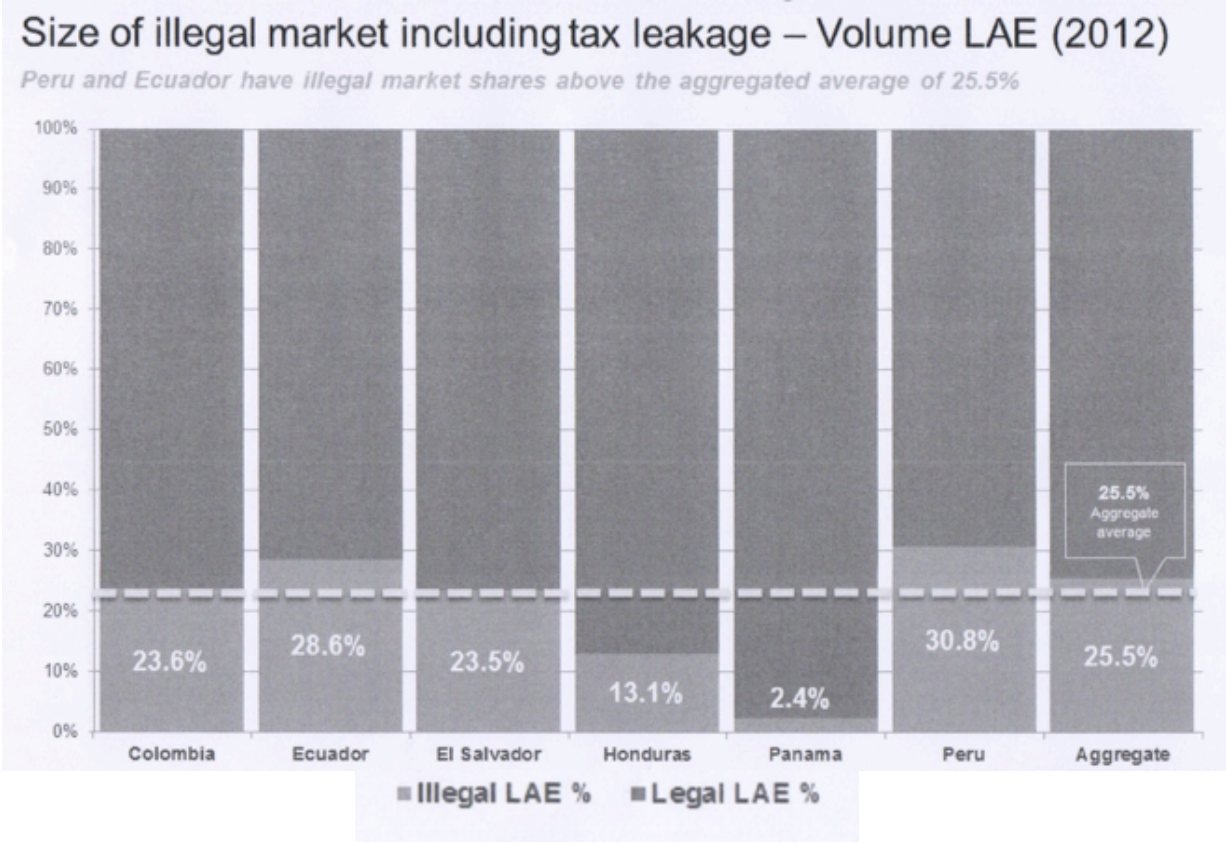


⁵⁰ Marco Turchini, *Averting counterfeiting in the wine industry: a supply chain-based framework*, Università degli Studi di Firenze, January 2012, p. 78.

⁵¹ *Ibidem*, p. 79.

I.2.e. Regional analysis: the case of Latin America

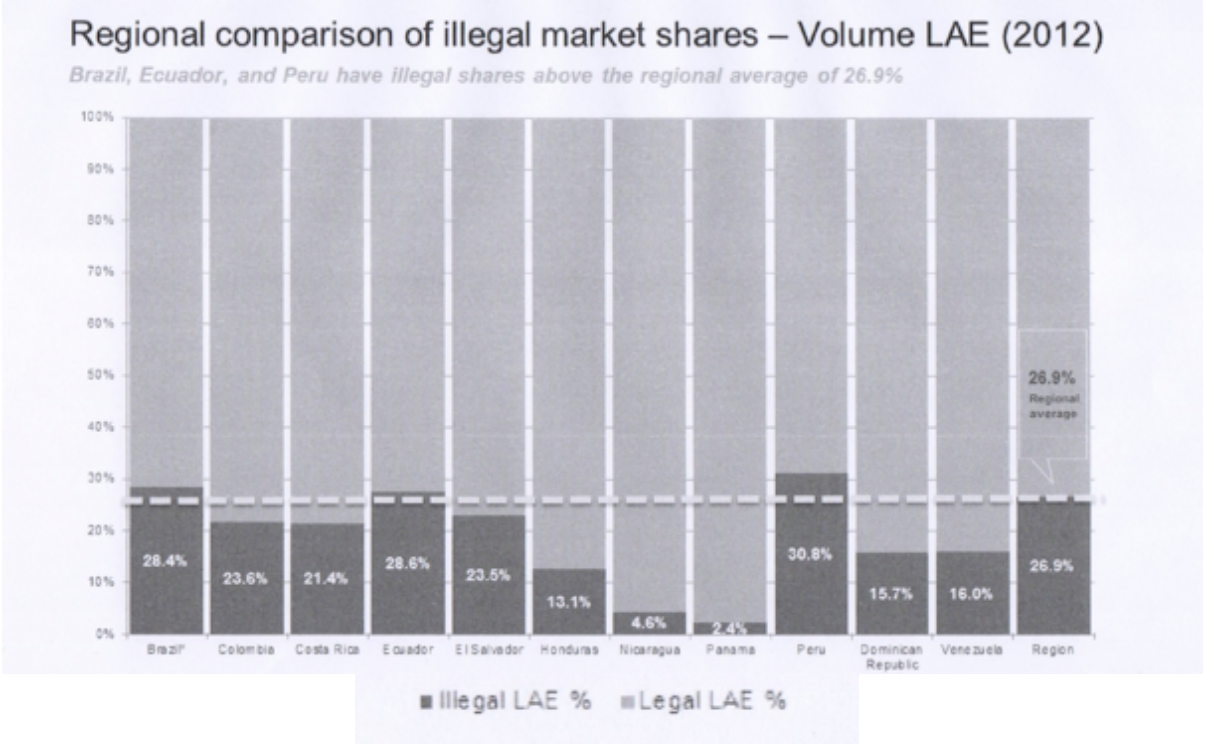
A study of six Latin American countries⁵² (Colombia, Ecuador, El Salvador, Honduras, Panama and Peru) revealed that on average a quarter of alcohols on these markets was illegal. Yet the average percentage in value terms for these six countries is 14%.



Price is also an important factor since the price of illegal alcohol is on average 30% lower compared to the retail price on the legal market in these six countries.

⁵² Euromonitor International, *Illegal Alcohol: Trends & Challenges*, October 2013.

Over a region as vast as Latin America⁵³ (eleven countries including Brazil), the average market share remains equivalent to that observed previously with 26.9% of illegal alcohol trafficking over the area.



The statistics from Brazil, the Dominican Republic and Venezuela are from 2011. The data for Brazil does not include the fiscal losses.

⁵³ Euromonitor International, *Illegal Alcohol: Trends & Challenges*, October 2013.

I.2.f. Financial and human cost

Financial cost

- UK: a study by the Institute of Economic Affairs⁵⁴ estimated that counterfeit alcohol costs the British treasury 1.45 billion euros. According to the National Audit Office this is mainly due to the taxes on alcohol which are higher in the UK compared to mainland Europe.
- Across the Latin American zone described above (Colombia, Ecuador, El Salvador, Honduras, Panama, Peru), the fiscal losses from the illegal alcohol trade increased in 2012 to 534 million euros, of which 340 million euros was attributable to Colombia.⁵⁵
- India: in 2012 fiscal losses associated with illegal trafficking and counterfeiting of alcohol are estimated to be in the region of 273 million euros, of which 31.5 million euros are from direct losses.⁵⁶ These figures appear to be underestimated.

Human cost

- Russia: 12,000 people died in Russia in 2011 as a result of drinking counterfeit alcohol (compared to 45,000 people in 2005).⁵⁷
- Twenty⁵⁸ people died in the Czech Republic in September 2012 after drinking adulterated vodka and rum.
- At least 80 people died in Kenya in early May from drinking illegal spirits.⁵⁹
- Around 500 people were hospitalized in Poland in 2012 because of glycol or methanol poisoning.⁶⁰

I.2.g. Internet

Unlike in the pharmaceutical industry, there are no global statistics on the sale of counterfeit or illegal wine over the internet. Reports from the companies MarkMonitor or Opsec Security include wider categories (generally “food and beverages”) in their analyses of the internet.

⁵⁴ Christopher Snowdon, “Drinking in the shadow economy”, *IEA Discussion Paper*, no. 43, October 2012, p. 23

⁵⁵ Euromonitor International, *Illegal Alcohol: Trends & Challenges*, October 2013.

⁵⁶ Federation of Indian Chambers of Commerce and Industry, *Socio-Economic Impact of Counterfeiting, Smuggling and Tax Evasion in Seven Key Indian Industry Sectors*, 2012.

⁵⁷ BASCAP report, *Promoting and Protecting Intellectual Property in the Russian Federation*, 2012.

⁵⁸ Philippe Collier, “Alcool frelaté: déjà 20 morts en République Tchèque” [Adulterated alcohol: 20 dead already in the Czech Republic], *Contrefaçon Riposte*, 18 September 2012.

⁵⁹ Jeune Afrique, AFP, *80 morts après la consommation d’alcool frelaté* [80 dead after drinking adulterated alcohol], 8 May 2014.

⁶⁰ Study by the Polish Spirits Industry (PPS), 2012, Source: OECD Task Force on Charting Illicit Trade (TF-CIT), Sub-Group on Alcoholic Beverages *Stakeholders contribution to the Assessment of the Size, Impacts and drivers of Illicit Trade in Alcohol*, February 2014, p. 5.

A study by the Italian researcher at the American Association of Wine Economics, Günter Schamel, highlighted the significance of the trade in empty wine bottles on eBay⁶¹. Yet analyses of this type are rare. Generally speaking, illegal trade probably follows market trends and the trade in empty Bordeaux Grand Cru bottles in particular had rocketed in 2009/2010, the years covered by the study, but this phenomenon now appears to be receding.⁶² Following our discussions, however, one might suppose that the on-line distribution of high-end wines would not be a particularly great problem in developed countries, as this product is mostly sold in specialist shops. In the case of China, however, it is necessary to gain a better understanding of the reality and scale of the phenomenon, which remains a mainly local problem.

According to Jean-Baptiste Thial de Bordenave, “in China, there would not be much interest anyway in making a ‘good counterfeit’ Bordeaux vintage visible on the Internet, as more discreet physical networks would more likely be used for its distribution.” Such a hypothesis remains to be validated, as it seems that many observers have a tendency to underestimate the importance of the Chinese web. By way of example, the e-commerce site Alibaba made 1.4 billion dollars in profit between the last trimesters of 2012 and 2013, i.e. three times more than Facebook and eight times more than Amazon for the equivalent period.⁶³ There are 242 million online buyers in China, and 25% of online wine purchasers buy wine from that site one to three times per month⁶⁴. Another example of this craze for purchasing wine online is the success of the site Yesmywine.

This specialist online site offers 5,000 different wines to 6 million registered customers, of whom a third are women, and sells on average 20,000 bottles per day.⁶⁵ In short, therefore, Chinese consumption habits are strongly geared toward the internet and would seem to involve a far better understanding of traffic associated with online counterfeiting of wine, especially as a result of local intermediaries.

⁶¹ Ruby Goldstein, *Are Empty Wine Bottles on eBay Being Used for Counterfeiting?*, 26 June 2009. <http://freakonomics.com/2009/06/26/are-empty-wine-bottles-on-ebay-being-used-for-counterfeiting/>

⁶² Interview with César Cambrade, March 2013.

⁶³ Lucie Robequain, “Les cinq questions qui entourent la méga-introduction en Bourse d’Alibaba” [“The five questions surrounding the mega-flotation of Alibaba on the stock market”], *Les Echos*, 7 and 8 May 2014.

⁶⁴ Sopexa Symposium, *The Chinese wine market*, November 2013.

⁶⁵ Adam Lechmere, “Connecting with Chinese consumers”, *Meininger’s Wine Business International*, 6 December 2013.

II. The main anti-counterfeiting technologies on the wines/spirits market

II.1. Specific features of the wines and spirits market.

Before describing the main anti-counterfeiting technologies, it is necessary to identify the specific features of the wines and spirits market.⁶⁶

II.1.a. General overview

Wines

We should remember that wine is a “living” product which evolves over time, and that stable components such as isotopes can also be authenticated.

Yet wine is a product capable of being preserved for a long time, and a long period of storage in the cellar risks altering the support of the authenticating elements. A protection technology used on a vintage wine would therefore need to be controllable several years or even several decades later.

There is also the problem of a global stock of millions of bottles running out before the protected vintages have worked their way through. A counterfeiter would be tempted to fake an older, well-regarded vintage which was never actually protected.

Spirits

A spirit is a stable product that may demand long-term aging in barrels, but has a short life cycle thereafter since cellar storage does not improve the taste.

The problems caused by the lifetime of technologies and by stocks running out therefore do not present the same risk as for wine.

It is also worth noting that the premium and super-premium spirits sector is growing more rapidly than that of standard spirits.

Problem of bulk goods

Still wines⁶⁷ and spirits can be transported in bulk and bottled in the destination region.

This presents the problem of reliability of local intermediaries in anti-counterfeiting measures. Even sending the rolls of labels, the taggants (nanoparticles) or print files containing the security elements can present a risk if these elements are diverted from their object. Furthermore, this gives large quantities of authenticators to a potential counterfeiter, who then has the wherewithal to carry out reverse engineering.

⁶⁶ Analysis elements supplied by Jean-Michel Loubry.

⁶⁷ Still wines are wines that do not form bubbles when the bottle is opened, source: Wikipedia (French site).

How should a bottle be protected? What needs to be protected?⁶⁸

- The contents
- The container
- The label, the counter-label
- The stopper
- The capsule
- The sale unit (packaging)
- The logistics unit

The content

Wines and spirits have their own signatures. A fake can be immediately detected by analysis. However, this requires the bottle to be opened in order to take a sample. The addition of markers is not helpful and is unacceptable to the majority of wine producers. These procedures are also complex and costly to implement. Furthermore, only large companies (such as Pernod Ricard) have the means to implement, within certain limits, such expert techniques.

The container (glass)

Hot and cold laser engraving techniques have been developed and enable bottles to be identified by unit or batch.

The glass itself is difficult to authenticate since manufacturing processes are relatively standard and irregularities in the material produce only slight variations.

In the case of the container, it is necessary to raise the problem of refilling. The container (bottle) indeed appears to be all the more important since the technique of **refilling empty bottles is the method of choice for counterfeiters,⁶⁹ particularly in China.** The average resale price for an empty Lafite Grand Cru bottle could be as high as 450 dollars.⁷⁰

Networks for recovery of bottles have actually been set up by Chinese criminal groups. To counter peering techniques, they recover bottle, cork and packaging that may be associated.

In these circumstances, any marking on the recoverable elements, even those linked to one another, is ineffective. The solution is then to protect an element which will be affected by the action of uncorking the bottle; this is usually the capsule, which must be destroyed in order to access the cork.

⁶⁸ Analysis elements supplied by Jean-Michel Loubry.

⁶⁹ Kate Levin, "Protecting Your Wine – And Your Winery's Reputation", *Wines & Vines*, 15 August 2013.

⁷⁰ Source: Jean-Michel Loubry

There are two ways of securing the capsule:

- by incorporating an authenticator in it (secure marking, taggants, etc.).
- by attaching a seal to it (label, tamperproofing strip, etc.)

It should be noted that many attempts at complex “mechanical” seals have been counterfeited: the future of capsule protection depends above all on the insertion of digital technology into the security system.

Yet it is important not to focus this risk of refilling solely on Asia, as other regions may be involved. For example, a significant spirit bottle refilling operation was dismantled in New Jersey in the US in May 2013⁷¹. The New Jersey Division of Alcoholic Beverage Control discovered during “Operation Swill” that 29 establishments in the region set up a fraudulent system of refilling empty, high-quality spirits bottles with lower-grade alcohols, which they then resold to their customers at the original prices. The case involved in particular brands of vodka (Smirnoff, Absolut, etc) or whiskey (Jack Daniel’s Black Label, Jim Beam, etc). The problem therefore may take different forms and it also involves developed countries.

The label / counter-label

There are many visible or invisible techniques in existence for the purpose of protecting a paper or other printed medium.

Some of these are carried out upstream of the bottling chain at the printing facility; others require an action on the chain.

A first level of difficulty presented to the counterfeiter is the use of printing techniques involving specific expertise or tools: embossing, microprinting, microperforation, inks or dyes having particular characteristics, etc.

A second level could be the addition of visible and coded or invisible information. This information is integrated into traditional printing processes.

The stopper

The natural cork stopper is a heterogeneous and fragile structure which is difficult to mark. Synthetic stoppers are easier to mark, but enjoy a less prestigious image than natural cork stoppers.

It is worth noting the development of screw-top bottles for both wines and spirits, replacing stoppers. However, this technology does not involve high-end products.

The capsule, coiffe or sleeve

Here, too, there are various forms of seal in existence ranging from the “fiscal stamp” on paper to labels that incorporate several technologies or even several materials. These devices are designed to detect the replacement of a capsule which was destroyed in order to open the bottle.

Dyes or inks adding elements of design may be protected. It should be noted that the materials used to make these items are tin, aluminum or PVC and this may result in restrictions on the use of certain protection technologies. Spirits bottles are often sealed by retractable PVC sleeves. Some suppliers of these sleeves incorporate security elements.

⁷¹ <http://restaurant-hospitality.com/drink-trends/fake-premium-spirits-scam-may-create-more-fallout>

The sale unit

This may be an individual carton, box or case.

It cannot be protected except by means of a tamperproofing device, because it is not destroyed when it is opened.

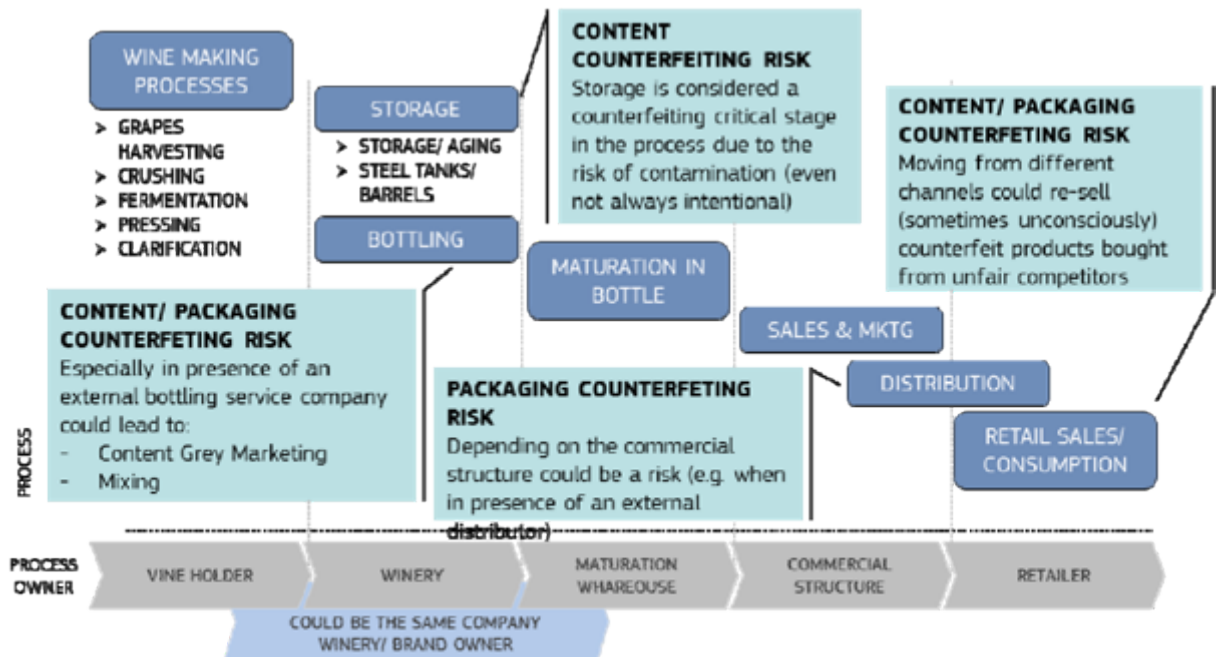
II.1.b. Logistics and risks of counterfeiting

Protection of the logistics circuit is more a matter of *Track & Trace*.

However, it is possible to distinguish four main weak points at the heart of the wine supply chain:

- risk of packaging and/or content counterfeiting, especially if an external supplier is used for bottling.
- risk of packaging counterfeiting depending on the commercial structure and a malicious distributor.
- risk of content counterfeiting during storage.
- risk of packaging and/or content counterfeiting, which may be unintentional, by distribution of counterfeit wines from other networks.

The four main weaknesses at the heart of the supply chain⁷²

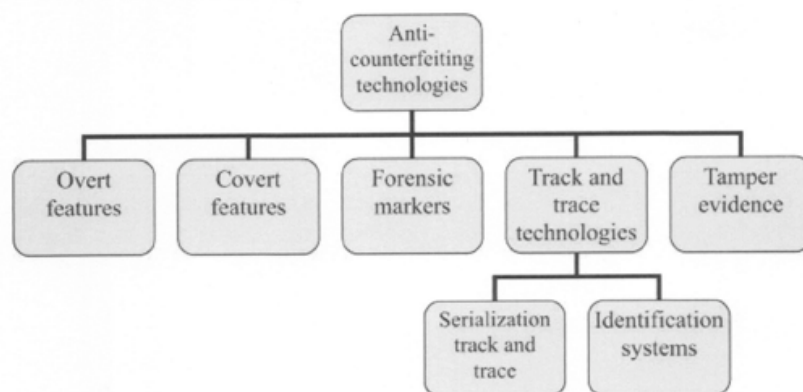


⁷² Marco Turchini, *Averting counterfeiting in the wine industry: a supply-chain based framework*, Università degli Studi di Firenze, January 2012, p. 34.

II.2. Anti-counterfeiting technologies that can be used for wines and spirits

II.2.a. General overview

Anti-counterfeiting technologies can be classified according to their use.⁷³



This classification does not prejudice performance, which depends as much on the device itself as on the tools, the protocols for checking and those carrying out the checks. These technologies are generally used by experts (customs, law enforcement services, private investigators, etc.). The end consumer is rarely involved in the authentication of the bottle he is drinking. It should be noted that digitization indeed permits a large degree of flexibility both within the secure authentication system and in the choice of the person who may or may not authenticate the product.

Generally speaking, these technologies may be described in greater detail as follows⁷⁴:

Tamperproofing

A tamperproofing device does not have an authentication function but enables the integrity of a product/package pairing to be ensured. Its aim in this is to demonstrate that the product has not been modified or substituted since leaving production. However, these devices are generally easy to reproduce.

Including authentication elements in these devices, where possible, brings an additional level of security.

Overt (visible) features

⁷³ Rajiv Dhar, “Anti-counterfeit Packaging Technologies”, *Confederation of Indian Industry*, August 2009, p. 15.

⁷⁴ Part drafted with the help of Jean-Michel Loubry.

Technologies provided with overt (visible) features are characterized by their accessibility to the user.

“Overt” authentication features include holograms, and, more usually, optical variable devices (OVDs), variable inks or films, watermarks, secure printing methods, etc. They are devices which reveal a unique feature when manipulated (concealed image, irisation, embossing, etc.). They are checked by an inspector who must have a minimum knowledge of what needs to be checked. By definition, the inspector does not use specific or “intelligent” tools for this inspection.

For the wines and spirits market, most of these technologies can be used in particular on existing or specific labels.

Generally intended for an unsuspecting public, their imitation can easily deceive and they can give “false assurance” about the identity of the product. Their cost is highly variable. The NFC technology can also be used with overt features (e.g. hologram stickers) and enable the accessible product to be authenticated using a mobile. The NFC furthermore permits a simple authentication to be validated by the end user, with virtually no risk of error of interpretation.

Covert (coded or hidden) features

Technologies provided with covert (coded or hidden) features are characterized by the need for an expert scanning system as these technologies cannot be read with the naked eye.

The inspector must be able to ensure (or be assured) that he has the right tool providing the right verification scenario (embedded or remote software), and must be trained or informed on how to use the tool.

“Covert” authentication features include hidden or coded imprints, digital markings, taggants (nanoparticles), added materials (chaos), RFID and certain intrinsic properties of the product material or its packaging. A dedicated tool is indispensable for capturing and decoding the information provided by these elements.

These features, which generally offer a good level of security, are extremely variable in terms of cost and complexity of integration. If the taggants are easy to add to an ink or dye, integration of an RFID (or NFC) chip adds complexity to the process. A connection to a database containing references may also prove necessary.

The “chaos” of materials usually found on the market includes bubbles, particles and fibers. This “chaos” may be obtained by the addition of materials to a product or by using the intrinsic characteristics of this product.

Covert technologies covered are extrinsic, i.e. they are added to the product or its packaging during the manufacturing process, or intrinsic, i.e. they result from risks associated with the material used or the manufacturing process. Within this technological family, the most frequently used form of intrinsic marking is the imaging of a specific zone of the product. This image becomes the product’s authenticating signature.

Features involving scientific analysis (forensic)

The “forensic”-type features include physical markers such as taggants, or biological markers such as DNA and other physical and chemical parameters (isotopes, etc.). Portable analysis equipment or laboratory material is necessary to carry out this type of check properly. For

them to be particularly reliable, these elements demand a rigorous and sometimes lengthy protocol for checking.

Forensic technologies are actually based on scientific analysis. They necessitate the use of laboratory tools, without necessarily requiring them to pass through a laboratory. Great progress has indeed been made in the miniaturization and mobility of these tools, particularly for the on-site inspection of medications. A rigorous protocol must then be put in place to capture the elements used for authentication; otherwise the results could be incorrect. It may be necessary to take samples but this would entail the destruction of the product.

Track and Trace technologies

These technologies come from the logistics industry and make it possible to ensure that the goods are traceable. As a result of numerous incidents involving the recall of goods, a diverse range of technologies has emerged in this area of activity. The barcode, low-cost and more popular in the first instance, followed by RFID, are the two most frequently quoted technologies in this environment. The application of RFID has been extended as a result of the anti-counterfeiting campaign, since many counterfeiting risks can emanate from the heart of the supply-chain (transporter, importer, etc.) and necessitate not only traceability but also identification by unit.

Tamper evidence features

Tamper evidence features are procedures which prevent access to the protected objects. Seals or markers form part of such techniques.

By way of example, the Italian government has created official seals⁷⁵ to protect the highest quality wines under the designations DOC (Vino a denominazione di origine controllata) and DOCG (Vino a denominazione di origine controllata e garantita). Yet such a technique cannot protect against malicious acts by counterfeiters as the unique character of the official seal cannot be guaranteed.

Finally, a major problem in the development of anti-counterfeiting techniques for the wines and spirits sector is posed by the practice of refilling⁷⁶. This problem arises in the same way as when the packaging of any product is reused, in that an empty box may be used to repackage a counterfeit product. Attention will therefore be focused on somehow or other preventing the uncontrolled reuse of packaging. For the purposes of protecting wines and spirits, the most appropriate technologies are those which may be associated with the destruction of elements by the action of opening the bottle. We are thinking here essentially of the capsules and other coverings used to wrap the head of the bottle.

In summary, we can say that the technologies are not perfect. Even if they are robustly designed, it is the environment in which they are used that makes them fallibl

⁷⁵ Marco Turchini, *Averting counterfeiting in the wine industry: a supply chain-based framework*, Università degli Studi di Firenze, January 2012, p. 144.

⁷⁶ Refilling: refilling empty branded bottles with cheap substitute alcohol.

III. Trends and criteria used in selecting an anti-counterfeiting technology.

III.1. The anti-counterfeiting market and its developments

When dealing with the counterfeiting problem, a solution is sometimes reached through negotiation between the rights-holders and the counterfeiters in order to arrive at a discreet financial compromise, or, more frequently, through legal action. Yet such strategies for dealing with counterfeiters or unscrupulous importers are rare in the wine business and, in particular, among the Bordeaux professionals⁷⁷. The outcome of any legal action is especially uncertain and the process may turn out to be slow and costly. Generally speaking, the counterfeiting of Grands Cru vintages has been accelerated by price inflation which has prompted counterfeiters to take advantage of this opportunity for growth. Alcohol counterfeiting is indeed likely to attract large-scale criminal organizations. For example, a Russian factory recently observed was manufacturing over 11,000 illicit bottles of alcohol per hour.⁷⁸ According to the OECD, there seems to be a growing trend toward the industrialization of alcohol counterfeiting techniques in Europe. International strategies exist, with raw materials imported from Asia or Eastern Europe and destined for packaging in other territories for local consumption. Yet there are also smaller-scale operations consisting of a few individuals. There are generally three types of counterfeiters: direct manufacturer, supplier of empty bottles or illicit alcohol, or intermediary within bars and clubs.

It is difficult for winegrowers to keep up with the global scale of such a variety of structures which are illicit, mobile and not sufficiently pursued by the local authorities, as confirmed by Château Latour⁷⁹: “the remote authentication of Grand Cru wines with wine merchants is virtually impossible”.

Under these circumstances, anti-counterfeiting technologies – particularly those intended to minimize the “Chinese risk” – have assumed a clear and incontrovertible strategic importance for producers of high-end wines and spirits. We can also see that, in the Chinese market, traceability methods are not always imposed on the importer, and the importers themselves are not always adequately monitored. Protecting the bottles upstream therefore appears to be essential.

“The real solution is to ensure that the bottles leaving Bordeaux are difficult to copy and easy to identify”, states Jean Guillaume Prats, chairman of the chateau Cos d’Estournel.⁸⁰

However, it is also essential to take underlying trends into account.

⁷⁷ Fabien Humbert, “Grands crus – La contrefaçon des vins de Bordeaux” [“Grand Crus – the counterfeiting of Bordeaux wines”], *Le Nouvel Economiste*, 6 October 2011.

⁷⁸ OECD Task Force on Charting Illicit Trade (TF-CIT), Sub-Group on Alcoholic Beverages *Stakeholders contribution to the Assessment of the Size, Impacts and drivers of Illicit Trade in Alcohol*, February 2014, p. 14.

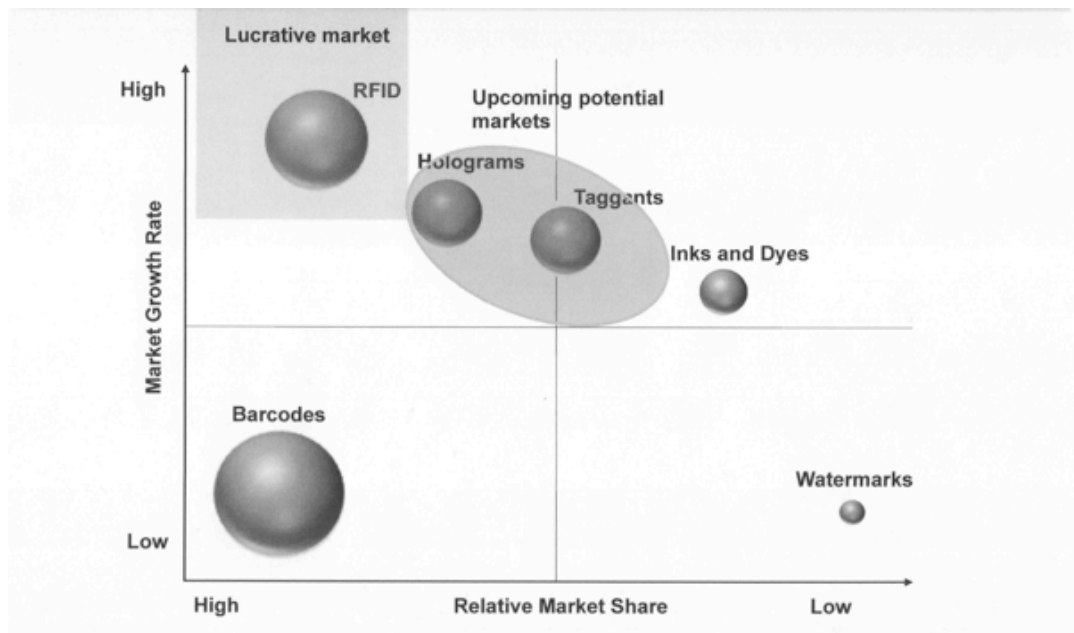
⁷⁹ Interview with Château Latour.

⁸⁰ Fabien Humbert, “Grands crus – La contrefaçon des vins de Bordeaux” [“Grand Crus – the counterfeiting of Bordeaux wines”], *Le Nouvel Economiste*, 6 October 2011.

III.1.a. The growing importance of RFID⁸¹

On this point, RFID technology – which, as we have seen, is already well positioned in many aspects – is likely to be a major development in security devices.

A recent study⁸² highlights this trend in terms of investment opportunities. RFID clearly appears to be the fastest-growing technology on the high added-value markets of which vintage wines or spirits are a central part.



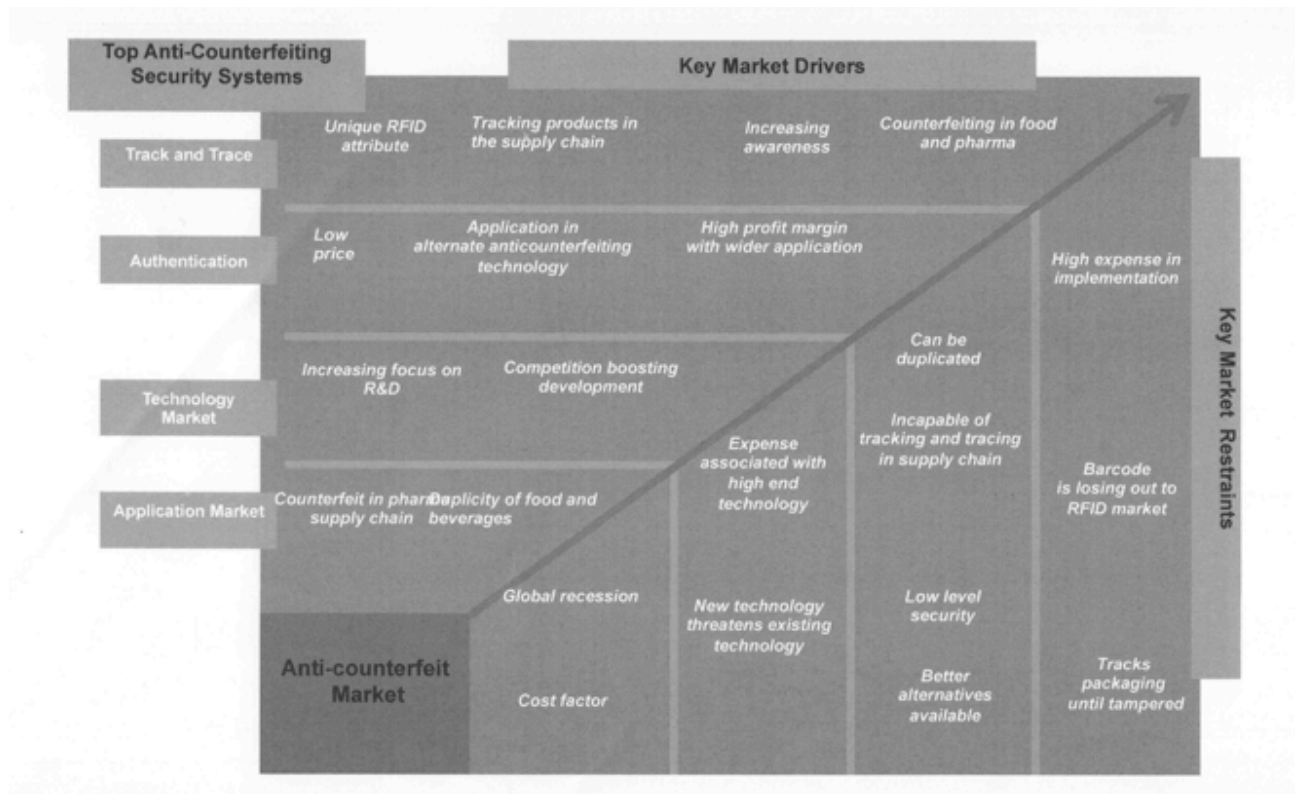
Among other trends on the “food” market, the above diagram⁸³ shows:

- the importance of consistent budgets adapted to the implementation of authentication technology.
- RFID will become essential for traceability purposes and requires a greater awareness of current *Track & Trace* issues.

⁸¹ More precisely, this refers to RFID without NFC technology.

⁸² Kunal Bhardwaj, “Global Anti Counterfeit packaging market for Food and Pharmaceuticals – Technologies & Global Markets (2009-2014)”, *MarketsandMarkets*, 2012.

⁸³ Kunal Bhardwaj, “Global Anti Counterfeit packaging market for Food and Pharmaceuticals – Technologies & Global Markets (2009-2014)”, *MarketsandMarkets*, 2012.



III.1.b. NFC technology

Technological environment

Near Field Communication (NFC) is a short-range, high-frequency wireless communication technology which enables information to be exchanged securely between peripherals. The technology can only be used over very short distances and assumes a proactive approach on the part of the user.

It also appears to be more efficient than the neighboring technology of QR (Quick Response) code.

“For QR code, you need to activate an application, then take and upload a suitable photo, then wait until it is processed... NFC does not have as many obstacles hampering its use: tags can be scanned immediately merely by approaching them. You no longer have to launch an application first. What’s more, with NFC you can not only scan information such as the QR code, but you can exchange it as well. Furthermore, the technology is capable of transmitting more data. And it does not need the same resources”, explains the spokesman for the French mobile wireless organization Association Française du Sans Contact Mobile (AFSCM).⁸⁴ For Jean-Christophe Lecosse, director of the national RFID⁸⁵ center, “The QR code is merely a barcode with a greater memory capacity. RFID is a more interesting long-term technology, particularly due to the prospect it offers of enabling several articles to be

⁸⁴ Virgile Juhan, “La NFC débloque de nouveaux scénarios de consommation” [“NFC unfreezes new consumption scenarios”], *Journal du Net*, 30 October 2012.

<http://www.journaldunet.com/solutions/mobilite/interet-et-utilisation-de-la-nfc/possibilites-de-la-nfc.shtml>

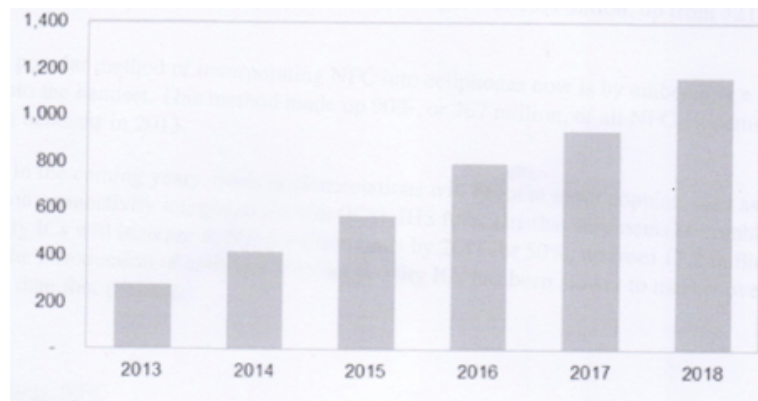
⁸⁵ Catherine Quignon, “Puces RFID à l’usage des PME” [The use of RFID chips by SMEs”], *Le Nouvel Economiste*, 12 December 2012.

scanned at the same time.” **NFC therefore makes it possible to obtain easier access to RFID technology** needing a specific scanner to read the information, **which is a major plus for a consumer with an NFC-enabled smartphone.**

The level of security provided by NFC is particularly high since this technology has been used in the banking sector for over twenty years.

According to the third Deloitte Global Mobile Consumer Survey⁸⁶, 10 % of consumers questioned in twenty countries said they were aware that NFC was a feature of their smartphone, i.e. double the figure for 2012. The technology seems destined for a promising future if we are to believe most of the prospective studies on NFC and its applications.

HIS Technology estimates that this technology will grow by 400 % between 2013 and 2018, reaching 1.2 billion units by that date.⁸⁷ NFC is expected to be available on two thirds of telephones launched on the market by that date.

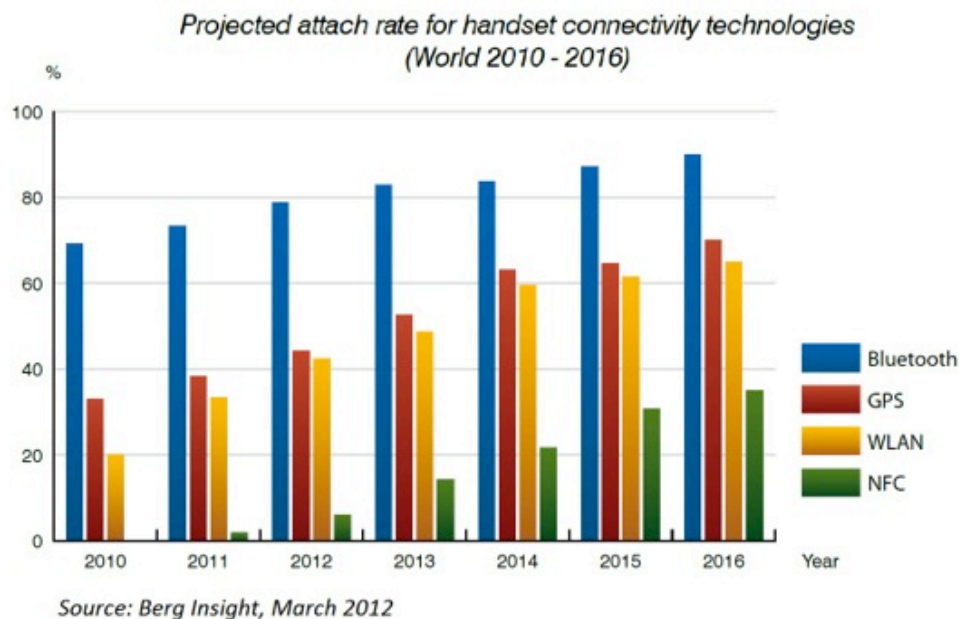


In millions of telephones delivered annually

⁸⁶ Rian Boden, “One in ten consumers say they have an NFC phone, *NFC World*, 25 November 2013. <http://www.nfcworld.com/2013/11/25/327051/one-ten-consumers-say-nfc-phone/>

⁸⁷ Zack Martin, “Consultancy: 400% increase in NFC shipments 2018”, *SecureID news*, 12 February 2014. <http://secureidnews.com/news-item/consultancy-400-increase-in-nfc-shipments-2018/#>

The following graph illustrates at global level the steady growth in terms of spread and market share of NFC technology compared to all mobile connectivity technologies.⁸⁸



Over the next two or three years we will see numerous applications emerging that are in the evaluation phase in most industrial and service sectors. The number of units sold with embedded NFC technology will thus increase from 4 million in 2012 to 43.4 million in 2017.⁸⁹

Some recent examples (2013-2014):

- 5,000 volunteers tested a means of payment using NFC for their London Underground tickets.⁹⁰
- Vodafone is going to offer NFC for use in its bicycle hire service for Barcelona, known as Bicing. Each user will be able to use it to pay for and access a bicycle using a smartphone.⁹¹
- BNP Paribas has also implemented NFC technology for its KIX mobile payment solution, aimed at retailers.
- The head of the distribution group Casino is testing NFC technology⁹² at its Belles Feuilles shopping center. The aim is to help some consumers find out more about products: if some labels produced are difficult to read, scanning them with a mobile phone then proves more effective and informative.

⁸⁸ Nick Wood, "NFC handset shipments reached 30 m in 2011", *Total Telecom*, 27 March 2012.
<http://www.totaltele.com/view.aspx?ID=472352>

⁸⁹ Source: AT Kearney, *The Mobile Economy*, GSMA2013.

⁹⁰ Rian Boden, "TfL tests NFC for London Underground ticket payments", *NFC world*, 24 April 2014.
<http://www.nfcworld.com/2014/04/24/328849/tfl-tests-nfc-london-underground-ticket-payments/>

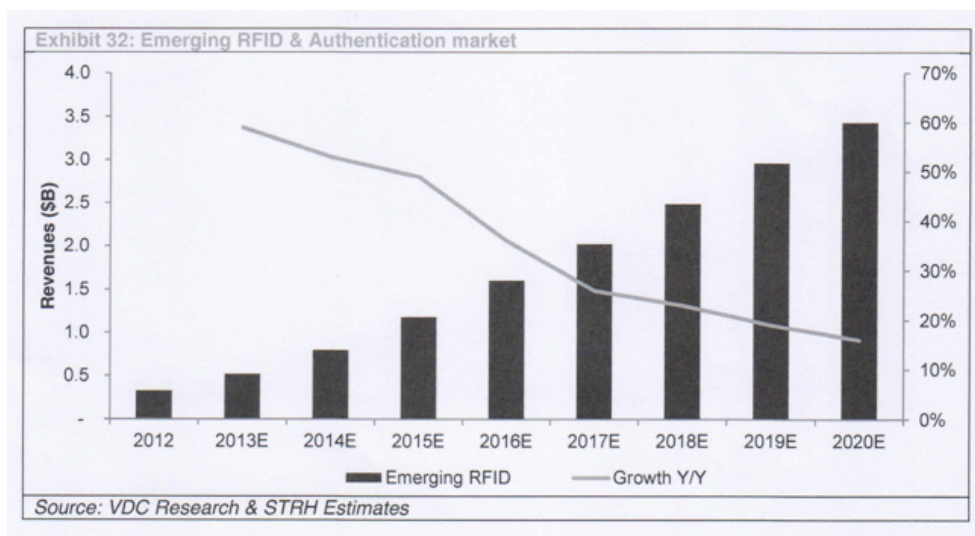
⁹¹ Rian Boden, "Barcelona bikes gets Voda NFC", *NFC World*, 26 March 2014.
<http://www.nfcworld.com/2014/03/26/328436/barcelona-bikes-get-voda-nfc/>

⁹² Sophie Curtis, "How NFC is transforming the weekly shopping experience", *Tech World*, 3 April 2013.
<http://features.techworld.com/mobile-wireless/3438410/how-nfc-is-transforming-the-weekly-shopping-experience/>

- Amsterdam Airport has installed boarding gates that can be used with NFC technology by passengers carrying a smartphone.⁹³
- In Canada, Connected Rogers is the first magazine that the reader can purchase using NFC technology.⁹⁴
- In China, one of the most significant implementations concerns the launch in June of NFC payments in 14 Chinese cities including Beijing and Shanghai⁹⁵. This initiative will be launched under a partnership between China Mobile, the world's largest mobile network operator, and China Union Pay, the Chinese bank card association. Eight Chinese banks are involved in this platform.

According to Hugo Salaun, president of AFSCM⁹⁶, NFC is a technology of the future which will start to make its presence truly felt in 2014. He considers that NFC has the advantage of being a standard and straightforward technology, which can be used securely by anyone. Another important argument: according to the KGI Securities, a Taiwanese firm known for the pertinence of its prospective analyses on Apple, the American company would finally need to acquire NFC technology within its iWatch model for 2014. As regards the iPhone 6, which is expected to be launched in the second half of 2014, it is strongly rumored that this model could be equipped with NFC technology.⁹⁷

The market value of RFID and authentication is expected to increase from 500 million dollars in 2013 to 3.5 billion dollars in 2020.⁹⁸



⁹³ Future Travel Experience, *Amsterdam Airport Schiphol installs NFC-enabled boarding gate*, 30 January 2014. http://www.futuretravelexperience.com/2014/01/amsterdam-airport-schiphol-installs-nfc-enabled-boarding-gate/?utm_content=bufferadc58&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

⁹⁴ <http://www.connectedrogers.ca/tag/nfc/>

⁹⁵ <http://www.startupbootcamp.org/blog/2013/july/10-largest-nfc-implementations-in-the-world.html>

⁹⁶ Rian Boden, "2014 will be the year of NFC" says new AFSCM president", *NFCWorld.com*, 13 February 2014. <http://www.nfcworld.com/2014/02/13/327796/2014-will-year-nfc-says-new-afscm-president/>

⁹⁷ Chris Martin, "iPhone 6 release date, price, specs and new features: When will Apple's new iPhone 6 be launched?", *PC Advisor UK*, 6 May 2014.

<http://www.pcadvisor.co.uk/news/mobile-phone/3436742/iphone-6-release-date-features-rumours-2014/>

⁹⁸ Zack Martin, "Consultancy: "400 % increase in NFC shipments 2018", *SecureIDNews*, 12 February 2014. <http://secureidnews.com/news-item/consultancy-400-increase-in-nfc-shipments-2018/>

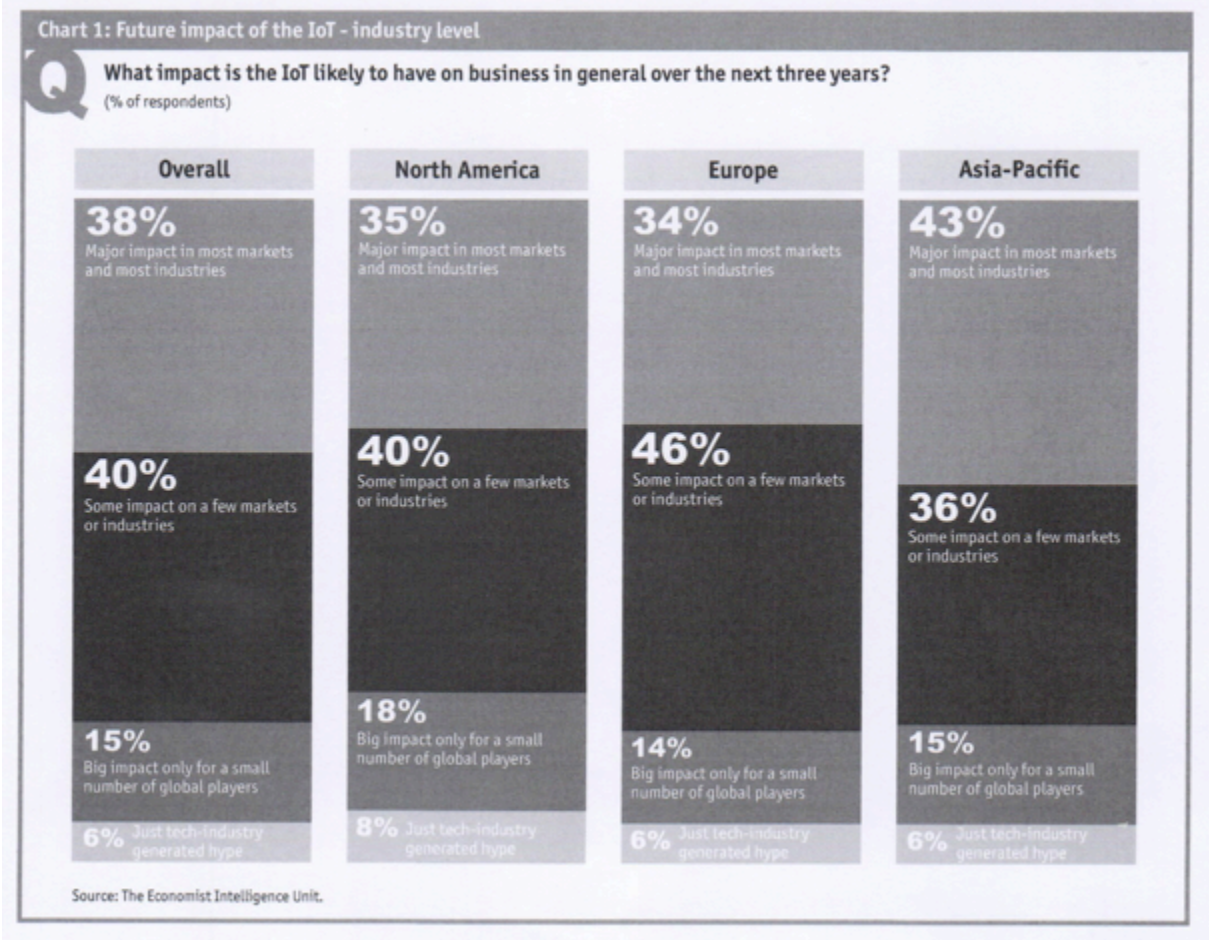
Graphic summarizing the surge in NFC technology⁹⁹



⁹⁹ GSMA graphic based on the report “The mobile economy”, using the following sources: ABI, Juniper 2011, Visa, 2012, Deloitte, 2012, Gartner, 2012, Juniper 2012, NFC Times, 2012, UK Cards Association, 2012.

The Internet of Things: a short-term issue.

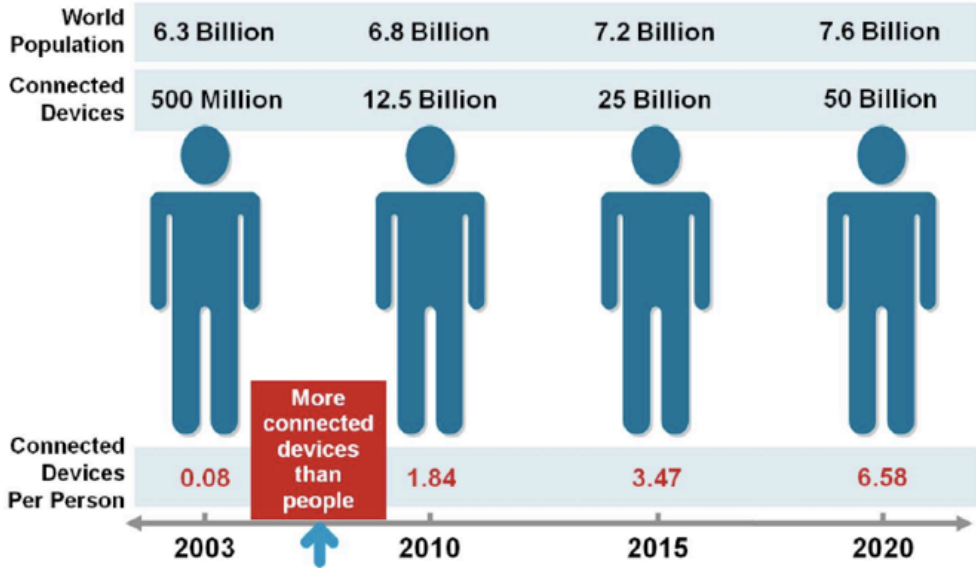
The take-off of NFC technology signifies the importance of the Internet of Things, which will have a real impact on all industries over the next three years, according to the great majority of persons interviewed for this survey carried out on behalf of The Economist Intelligence Unit.¹⁰⁰



¹⁰⁰ Report: The Economist Intelligence Unit, *The Internet of Things Business Index*, 2013.

Internet of Things: a medium to long-term issue.¹⁰¹

According to Cisco IBSG, the Internet of Things is expected to number almost 50 billion connected devices by 2020, compared to 12.5 billion recorded in 2010. These figures are likely to be modified since they are based on our current knowledge, and technological advances could accelerate this strong trend.



Source: Cisco IBSG, April 2011

III.1.c. The strategic importance of the consumer in anti-counterfeiting devices for wines and spirits.

The consumer of wines and spirits generally has faith in brands and trade names (points of sale). If this confidence is not complete, he will try to verify the conformity or authenticity of the product he wishes to purchase or is about to consume.

The first control level¹⁰² is the presence of an integral tamperproofing device (unbroken, not reconstituted). This type of control does not require any particular knowledge: the two parts of screw cap on a bottle must be solid, any packaging must be correctly closed and without signs of having been opened. If in doubt, the consumer will not purchase or consume the bottle in question. In order to make his choice or carry out additional checks, the consumer will examine the information shown on the product (indicating provenance, labels, precautions, etc.). If the brand has implemented this functionality, the consumer can refer to a website using a Data Matrix or a QR code via his smartphone. The consumer will then have details which involve only the person that put them online: if the item is a counterfeit, the details in question will probably not be reliable.

¹⁰¹ Source: Dave Evans, “The Internet of Things, How the Next Evolution of the Internet Is Changing Everything”, *Cisco IBSG*, April 2011.

¹⁰² Analysis elements in this paragraph: Jean-Michel Loubry.

If the consumer wishes to check the authenticity of the product, i.e. that the product has been placed on the market by the “proper” manufacturer, he must have access to secure means for carrying out this verification. Whatever these means are, the consumer needs to know what to check and how. This implies the provision of information about the brand to the consumer.

As described in this study, numerous solutions exist for “marking” a product. This plurality makes it impossible for a consumer to memorize the markings and distinguish between them. Except in specific cases, he will have to call on external assistance by means of a tool that is as standardized as possible, i.e. a widely used (multi-usage) tool.

According to a recent article by the French chemists’ society Société des Experts Chimistes de France¹⁰³, there is a strong current trend to **place the consumer at the center of the anti-counterfeiting device** by enabling him to check the authenticity of the product he is purchasing himself using his smartphone. The process consists of associating a unique identifier with each bottle of wine or spirits and registering this identifier in an accessible database. This enables the consumer to check remotely in the database whether the identifier matches the bottle in question. The code is usually digital or alphanumeric, but a graphical representation on the object is also possible and can be compared with the one on the database.

The fact that the consumer can easily verify the authenticity of the bottle offers a **great advantage in terms of simplicity** and the smartphone offers greater **flexibility of use** compared to devices which require specific control equipment. There is a great variety of these dedicated verification systems but it is impossible for the verification services (laboratories, customs, etc.) to have all the necessary equipment at their disposal. Another inconvenient aspect of these dedicated verification systems is that verification is carried out *a posteriori* in case of doubt and once a large proportion of the counterfeit wines or spirits has already been distributed. The fact that the “signatures” (integrated in the glass, molecular with synthetically derived DNA, holographic, etc.) are very difficult to reproduce is therefore not a sufficient reason to protect a bottle from the risk of counterfeiting, since using specific control apparatus complicates and undermines the extent of the verifications. The counterfeiters are aware that the goods are unlikely to be checked and manage to make visual imitations of these signatures, with give the consumer a false sense of security since the likelihood that mass-produced items such as wines and spirits will be verified remains exceedingly low.

This means that the smartphone solution cannot function unless security principles are taken into account, especially in the management of SMS.

There is actually a risk to the consumer of ending up on a pirated site, hence the importance of an SMS which has a dynamic security protocol permitting strong authentication and reducing the risk of fraud.¹⁰⁴ However, SMS has the advantage of providing a direct and specific computer connection, which minimizes such a risk.

¹⁰³ Claude Fontenoy, Michel Conorcet, “Nouveautés techniques et industrielles: l'utilisation du SMS comme moyen de lutte contre la contrefaçon de grands vins” [“Technical and industrial innovations: using SMS as a means of combating the counterfeiting of fine wines”], no. 980, *SECF*, 1st Semester 2014.

¹⁰⁴ Qingfeng Chen, Chengqi Zhang, Shichao Zhang, *Secure Transaction Protocol Analysis. Models and Applications*, Springer Verlag Berlin, Heidelberg, 2008.

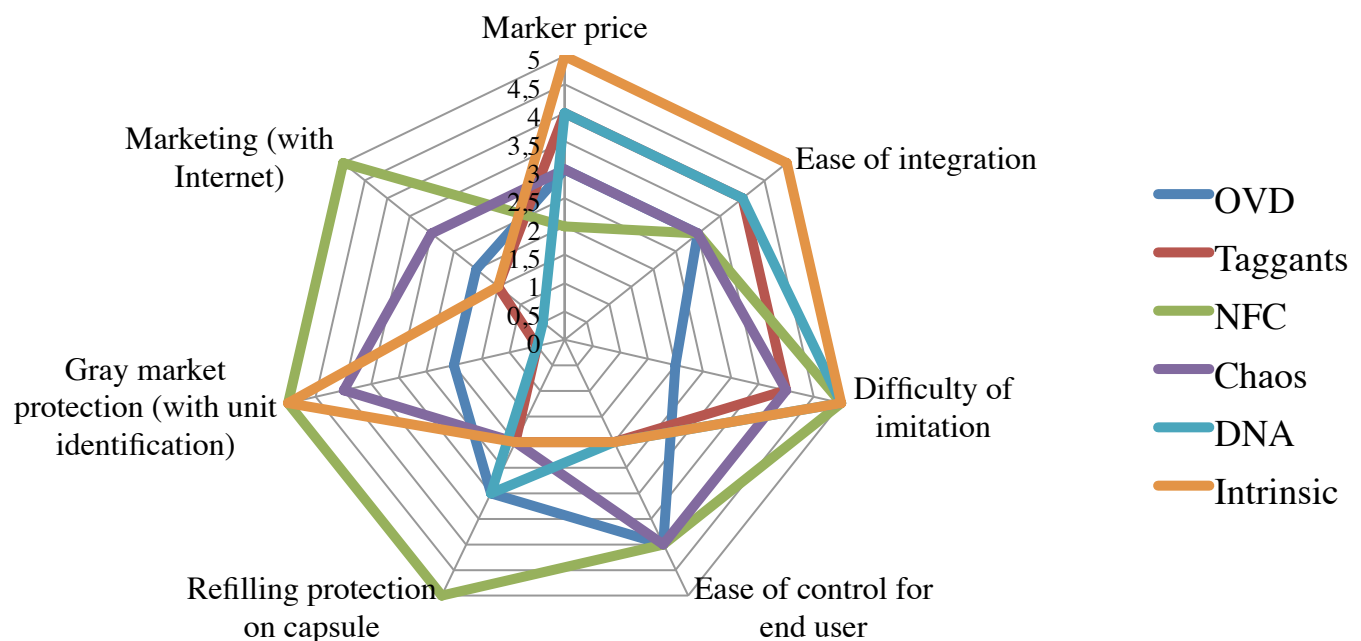
These authentication elements that can be controlled by the consumer by means of a tool likewise offer a number of advantages:

- They can be easy to integrate.
- They are unknown to the uninitiated.
- They can easily be reinforced.
- They may entitle the holder to manage the entire process.

More generally, it is necessary to define the criteria for choosing a technology.

III.2. Criteria for choosing an anti-counterfeiting technology

Diagram showing the main anti-counterfeiting technologies evaluated on the basis of six criteria¹⁰⁵



Such a scheme is not as such an exclusive tool for choosing a technology since it is necessary to take into account the extent of the counterfeiting problem for the alcohol in question, its pricing, the company's budget, its strategy, etc., as well as the proprietary solutions that the producer may own.

However, this diagram enables several trends to be illustrated:

¹⁰⁵ Source: Jean-Michel Loubry, Eric Przyswa, April 2014.

- **OVD** technologies¹⁰⁶ in particular holograms, have lost their influence and although they are reasonably priced and relatively easy to integrate, they appear to be slowing in the wines and spirits sector even for mass-market solutions, since counterfeiters have become highly skilled at counterfeiting such protective devices. This reservation is confirmed by Olivier Chotard, Head of Information Systems at Château Margaux, for whom security holograms on the label also present aesthetic problems.
- **Nanotechnologies** are a medium-price solution but are scarcely reliable for surveillance of the gray market. Such surveillance can only be ensured by means of a unitary marker, i.e. different for each product unit, but taggants only allow marking of the batch, which is a serious limitation for the protection of the wines and spirits market.
- **DNA** protection, as we have seen, requires dedicated laboratory-type equipment for carrying out this kind of check, and is certainly reliable but implies a rigorous and lengthy control protocol. On the other hand, the low probability of inspections may encourage the development of counterfeits. The use of such a procedure on the wines and spirits market could only be partial, and significant only in the context of investigation and inquiries. This type of protection is moreover of limited effectiveness for protecting the gray market.
- The technology of **chaos** and **bubble code** retains a certain credibility in the sector, but predominantly for mid-range alcohols. It remains suitable for protection of the gray market.
However, its cost is between the OVD and RFID-NFC technologies and would therefore appear to be a relative asset. Its ease of integration is on average also equivalent to that of RFID-NFC technology. Yet its main weak point is without doubt its relative protection for refilling, which is a major risk. The relationship of this technology to the consumer and to marketing issues has less potential than RFID-NFC. Finally, a risk identified by certain producers (Château Margaux and Château Latour) relates to the appearance of inexpensive 3D printers, which undermines such anti-counterfeiting technology.
- **NFC** technology clearly appears to be the most secure solution and the one most suitable for uses that do not focus entirely on anti-counterfeiting measures. It is particularly appropriate for high-range alcohols (vintage wines, premium and super-premium spirits) since there is a real cost of investing in such a solution. We have also seen previously that NFC has been both more reliable and more potent than the neighboring technology of QR Code. However, this latter technology can still be an anti-counterfeiting option for mid-range wines or standard spirits. Yet it is a choice which above all has the advantage of being easy to integrate on a large scale and at low cost, and which is more suitable for alcohols which do not keep well.

RFID-NFC should in fact be regarded as a long-term investment, and in terms of budget it is

¹⁰⁶ OVD: optical variable devices.

likely that the acquisition costs for such a technology will come down as its use becomes more widespread.

There is also the question of its integration, which requires a certain number of conditions to be met beforehand.

ROI

The problem of calculating ROI is that it is necessary to understand the starting point. Outside the field of counterfeiting, the figures are merely estimates. Any technology for anti-counterfeit marking, if regarded as an insurance, is always too expensive. This is why the offer is very often rounded off by a marketing and market surveillance strand together with unitary identification (serialization) and authentication.

However, the strongest risk of commercial and financial impact comes from the consequences in terms of image if such illicit trade is revealed, particularly for high-end wines. The significant case in China involving trafficking of bottles of Château Lafite resulted in a fall in the selling price. As explained by Wang Xinliang, from the Beijing branch of the Shanghai Wine Exchange: “Following a peak in 2009-2010, prices began to fall sharply in 2011, possibly by as much as 50% to 80% for some Grand Cru wines”¹⁰⁷. This spectacular drop is certainly due in part to the appearance of a financial bubble linked to speculation, but also originates from the large amount of counterfeit Château Lafite being traded on Chinese territory. By way of example¹⁰⁸, 10,000 counterfeit bottles (valued at 16 million dollars) of this prestigious brand were seized in the province of Zhejiang at the end of 2012.

It is also necessary to present the main technologies according to the strategic criteria in the decision-making process.

III.2.a. Decision-making process in the acquisition of an RFID technology¹⁰⁹

Even if NFC is the most suitable solution for high-end or luxury products (vintage wines, premium or super premium spirits), it is still necessary to take a certain number of precautions when choosing this technology. The researcher Mikko Lehtonen from ETH Zurich has defined four criteria¹¹⁰ to be considered when acquiring an RFID technology for the purpose of combating counterfeiting:

- Authentication. It is important to ascertain who will authenticate the product and in what kind of environment. The constraints and expertise to be enlisted will vary depending on whether the person making the check is a customs officer, a warehouse employee or a consumer.

¹⁰⁷ Wang Zhuoqiong, “Vintners looking for another vintage year”, *China Daily USA*, 20 February 2012. http://usa.chinadaily.com.cn/epaper/2012-02/20/content_14647391.htm

¹⁰⁸ Rupert Millar, “10 000 bottles of fake Lafite uncovered in China”, *The Drink Business*, 8 November 2012. <http://www.thedrinksbusiness.com/2012/11/10000-bottles-of-fake-lafite-uncovered-in-china/>

¹⁰⁹ Here we mean RFID technology in general.

¹¹⁰ Mikko Lehtonen, *Towards Optimal Level of Security in RFID-based Anti-Counterfeiting*. In *Workshop on Pervasive NFC/RFID Technology and Applications (PERTEC)*. PerCom'07, White Plains, New York, March 2007.

- Degree of security. In the long term this must be harmonized in accordance with the value of the product.
- Cost of the solution.
- Physical constraints of the product. For most bottles there is a particular problem of visibility of the tag and its integration. On this point, RFID permits discreet and robust integration.

Lehtonen's argument could be completed by specifying that, in the case of the RFID – NFC pairing, the cost should not be calculated on the basis of limiting the number of counterfeit bottles, but should also take into account the productivity gains in the supply chain and the marketing advantages associated with the device. For example, RFID enables a supply chain manager to save time in the processing of certain logistics operations, or a retailer to access the stock inventory more easily. For a consumer, this technology makes authentication more reliable while remaining easy to use.

As regards the level of security, it is more likely that the emphasis will be on aspects relating to the tag than the encryption. Indeed, according to Eric Filiol¹¹¹, head of research at l'ESIEA, the counterfeiting issues in the spirits market continue to play out on the tag. It is therefore necessary to verify the authenticity of the tag and to check that it has not been modified or reproduced. An expert such as the consultant Dominique Paret recognizes that, theoretically, the security references of the Inside Secure chip (ISO and certification EAL5+), when used for anti-counterfeiting purposes, are a genuine strong point. It should also be noted that there are different categories of tags with suppliers offering either unprotected tags (standard or NDEF), more or less protected tags (MIFARE technology from NXP, for example), and technologies that are completely protected by a chip which carries out dynamic encryption (Inside Secure chip). However, in addition to technical performance, the two experts also stress the importance of after-sales service by the supplier, who is permitted to assist the customer if there are problems with the chip in question (determining the real origin of a physical problem on the tag or a breakdown in the antenna, for example).

At this stage of the argument it should be pointed out that high-end wine producers are also SMEs. **Most small businesses in France have long resisted the idea of using RFID**, but the use of such technology could nevertheless be a solid asset for such structures.¹¹² One prerequisite is that the SME in question has good control over its production and its suppliers. This harmonization must therefore be present in terms of logistics and must also relate to the entire wine production as specified by the producer Château Latour.¹¹³

RFID technology highlights this trend and, as stated by Jean-Christophe Lecosse, director of the national RFID center¹¹⁴: "The more heterogeneity you have in the products in terms of their nature, packaging, size or conditioning, the more difficult RFID will be to implement."

¹¹¹ Interview with Eric Filiol.

¹¹² Catherine Quignon, "Puces RFID à l'usage des PME" ["The use of RFID chips by SMEs"], *Le Nouvel Economiste*, 12 December 2012.

¹¹³ Interview with Château Latour.

¹¹⁴ Fabien Humbert, "Les prérequis de la RFID" ["The prerequisites for RFID"], *Le Nouvel Economiste*, 23 March 2012.

RFID may however turn out to be a potent technological choice if SMEs have the capacity to interlink their various information systems (marketing, accounting, service quality, etc.). The management of information collected using this technology must also be considered in advance and the business must have a clear vision of what it plans to do with such a mass of data. The problem is therefore more organizational than technical, and has become particularly acute among some wine producers, few of whom have a sufficiently sophisticated IT or digital system. The latter also doubtlessly have an excessive tendency to favor interpersonal relationships¹¹⁵ in the choice of technological protection, while neglecting any rational approach to what is available on the market; the importance of having an information culture, particularly a digital one, is indeed highly complex. The acquisition of such a culture could be a powerful management lever if, as we have noted, RFID is well integrated in their organization. This therefore involves bringing information management skills in-house, and also making the management as well as all the players in the relevant supply chain aware of such a strategic choice.

Finally we are faced with **the question of choice of supplier** of anti-counterfeiting solutions; at this point and during the interviews, a number of criteria emerge in the choice of company:

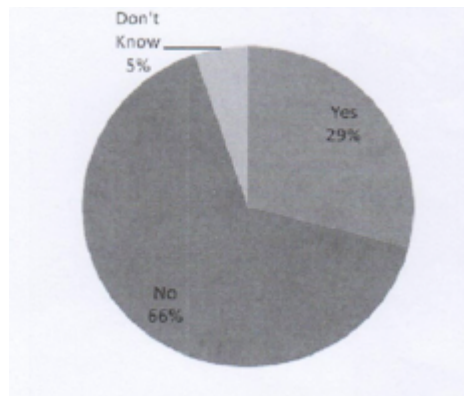
- It is important that the supplier is associated financially or commercially with one or more major corporations in order to reassure the customer of its sustainability and industrial potential.
- As we have seen, the choice of supplier may depend on variable parameters, in particular the specific problems of each company and the available budget. However, for high-end solutions, the combination of “Authentication/Track & Trace/Smartphone NFC” appears to be a future solution. Yet purchasers, who are rarely endowed with a strong digital culture, must obtain information on the performance and security of such a device. The supplier of such a technology must therefore provide information about the potential power of such a device for the company, while at the same time “evangelizing” about it for educational purposes, by demonstrating not only the security benefits of such an investment, but also its industrial and marketing advantages.
- According to Oliver Chotard from Château Margaux, such a supplier must also prove that it really is able to adapt to the specific and quality-related problems of the high-end wine sector. This question is even more important for suppliers of RFID-NFC technology, which is particularly innovative. The “advice” and “service quality” parameters are vital for such technology.
- Technological and commercial references in other sectors known for their security are positive (banking and finance, for example).
- The supplier must comply with industrial and digital standards.

It is essential that the choice of supplier is not made by one individual. Instead, the decision-making process should involve the entire managing board of the company, especially in the case of high-end wine producers. This approach has been properly implemented by Château Margaux, which is one of the rare producers to have in-house digital expertise.

¹¹⁵ Philippe Collier, Les plateformes multiservices réorganisent les offres pour tracer et authentifier les vins” [“Multiservice platforms are reorganizing the products available for tracing and authenticating wines”], *Contrefaçon Riposte*, 29 April 2014.

Finally, the **dimension of “anticipation”** is equally important. Yet there is no doubt that many wine producers have delayed their response, surprised both by the emergence of the massive Chinese counterfeiting problem and by the implementation of technologies of which they have little experience. A survey carried out in 2009 shows that only 29% of producers had taken steps to protect themselves from counterfeiting at the time. This low percentage is probably explained by the fear producers have of being associated with fraudulent activities.

Producers who have taken steps to prevent counterfeiting¹¹⁶



For quality or even very high-quality products, it is vital that the chosen solution¹¹⁷

- makes it possible to anticipate and adapt to future problems.
- It is likely that unforeseen problems will appear when such technologies are used but it is a matter of minimizing them and ensuring that the supplier is present in such a case.
- This solution must be standardized and normalized at international level.
- The question of standards is indeed particularly strategic.

III.2.b. The question of standards

An important factor to consider when choosing a technology is that the chosen technology must be evaluated according to the standard ISO 12931.

The standard ISO12931 was prepared by the ISO Project Committee 246 (PC246) on the basis of an initiative from France. The standard ISO 12931 defines the performance criteria for technical solutions for anti-counterfeiting measures in the field of material goods. “Moreover, the standard does not stop at the strict definition of counterfeiting (violation of property rights) but indicates that using authentication solutions to differentiate between genuine and fake could be useful generally, and especially if there are risks to the health and

¹¹⁶ Survey of 260 wine producers worldwide (France, United States, Australia, New Zealand, Portugal, Chile.) Source: Rhys Pender, “Counterfeit Wine – Its Impact on the Business of Wine”, *dissertation, The Institute of Master of Wine*, March 2010, p. 27.

¹¹⁷ Frost & Sullivan, *How to Win Your Anti-Counterfeiting War*, December 2011 p. 11.

safety of individuals.”¹¹⁸. On the other hand, the standard ISO 12931 is technologically neutral, centered on objectives and not on means: it provides an analysis grid for correlating the solution offered and the requirement. A properly conducted preliminary analysis will enable the performance of the chosen anti-counterfeiting solution to be optimized; such performance will also be closely linked to the types of product concerned and the context in which these are to be used.

This standard also specifies a list of criteria which, at the different levels of the authentication solution, will define its performance.

The standard therefore enables the company wishing to implement an anti-counterfeiting solution¹¹⁹:

- to make the link between its need for protection and the practical environment for using the technologies in the particular context of the business and its markets,
- to evaluate the suitability of the solutions offered by the suppliers.

However, the risk analysis remains essential before considering the performance criteria defined in the standard.

Finally, the standard ISO 12931 also allows elements of proof to be provided to support legal action.

The question of digital standards must also be considered. NFC is likewise used with a standard, namely ISO (ISO/IEC 18092 / ECMA-340), and it is preferable for the digital aspects of anti-counterfeiting solutions to be in line with such standards. These standards have the dual advantage of providing security for the consumer when he checks the authentication of the product, but also of sustaining the technological choices by wines and spirits producers in their equipment. Another advantage of such standards is that they ensure the sustainability of the solution and the capacity to choose a different supplier who can then take the solution in hand.

In summary, it is important that the supplier demonstrates its capacity to be able to adapt its product to both physical and digital standards.

Analysis of the choice of technology must also be carried out according to well formalized objectives and on the basis of normative procedures (risk analysis, performance evaluation, etc.).

III.2.c. The best anti-counterfeiting solution

According to a report by the French General Directorate for Competitiveness, Industry and Services (DGCIS)¹²⁰, **the layering of several anti-counterfeiting solutions is without doubt the best approach in terms of protection.** Indeed, “this mix aims to complicate any

¹¹⁸ Jean-Michel Loubry, “La norme ISO 12931: une aide à la navigation dans le monde des solutions de protection contre la contrefaçon” [Standard ISO 12931: a guide to navigating the world of anti-counterfeiting solutions], *Contrefaçon Riposte*, 10 April 2012.

¹¹⁹ Dgcis, *Guide pratique pour mettre en œuvre les solutions d’authentification des produits manufacturé* [Practical guide for implementing authentication solutions for manufactured products], June 2010, p. 21.

¹²⁰ Dgcis, *Guide pratique pour mettre en œuvre les solutions d’authentification des produits manufacturés* [“Practical guide for implementing authentication solutions for manufactured products”], June 2010, p. 11.

attempt at copying and permits selective access to various protective devices according to the persons carrying out the checks”.¹²¹

The mix ideally integrates three techniques in combination¹²² which we have described above:

- An authentication or anti-counterfeiting solution to confirm that the bottle is authentic.
- A *Track & Trace* solution which enables the bottles to be traced.
- Marketing is the third pillar and enables the consumer to access the interactive content by scanning the code on the packaging of the bottle.

According to Maureen Downey of Chai Consulting, it is equally important to combine a “low tech”¹²³ solution with “high-tech” solutions, because several levels of security are needed when faced with counterfeiters who are developing increasingly sophisticated and rapid strategies. This viewpoint is confirmed by the wine producer Châteaux Margaux, which uses three security systems (laser etching, bubble tag and secure paint). According to Olivier Chotard, Head of Information Systems, these three solutions make it possible for this great vintage to cross-check information and optimize security if one of the protection methods should fail, and it also acts as a deterrent.

A strategic point raised during discussions, in particular with Château Latour, is the importance of protecting the bottle at capsule level (instead of behind the label, for example). Indeed, any technology associated with the capsule also offers protection against refilling, but there is no technology per se that offers greater protection against refilling.¹²⁴ What matters is that the technology in question cannot be imitated and that it is not possible to remove it without spoiling the bottle. Protecting the device once it is in place is therefore essential.

One problem is ensuring that the device is at the same time:

- discreet,
- adapted to the shape of the bottle,
- provided with innovative technology, and
- has a seal attached (label, tamperproofing strip, etc.).

As indicated above by the consultant Jean-Michel Loubry, many attempts at complex “mechanical” seals have been counterfeited, and in future the best capsule protection will involve a digital security system. According to the consultant Dominique Paret, a solution which, for example, incorporated an RFID technology adapted to the constraints of the bottle design, might turn out to be suitable. According to him, the tag would ideally be rendered useless once the capsule is removed. Focusing on a form of protection with a tag integrated in the capsule is a point of view also shared by the expert Eric Filiol.

The marketing dimension is crucial and, as explained above, is based on **the growing**

¹²¹ *Ibidem*.

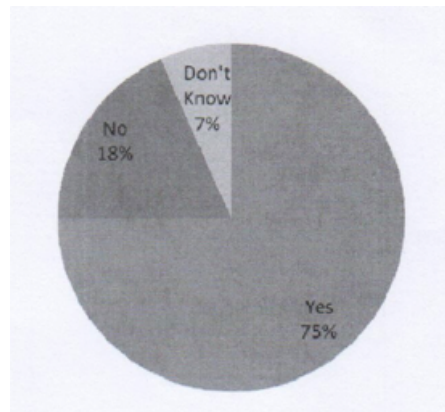
¹²² Tina Vierra, “The Proof Is in the Packaging”, *Wines & Vines*, August 2003.

¹²³ Maureen Downey quoted by Chris Bennett, “Wine fakes didn’t begin or end with Rudy Kurniawan”, *Western Farm Press*, 10 September 2013.

¹²⁴ Source: Jean-Michel Loubry.

importance of the role of consumers in spotting counterfeits¹²⁵. This trend seems to have been underestimated for too long, **since 2009: 75% of consumers stated that they would prefer to purchase a brand of wine protected with anti-counterfeiting technology**. It is a phenomenon which has probably increased with the proliferation of counterfeit wines on the Chinese market.

Consumers prepared to purchase a brand of wine using a form of anti-counterfeiting technology¹²⁶



It is likely that the producers have underestimated not only the real impact of Chinese counterfeiting but also the strong perception that the consumer may have of such a problem. It is therefore necessary not only to create new marketing links using the most up-to-date anti-counterfeiting technologies, but also to protect the producer's brand and image by also creating, as specified by Château Latour, **"a trust-base relationship with the consumer"**.¹²⁷

Indeed, a number of articles and observers emphasize the importance of putting together an information campaign with the consumer, who will increasingly become the best defense against counterfeiting. There is a clear weakness in China on this point, but the situation is expected to improve over time due to the increase in the range of local wines, combined with a society that is better educated and more sensitive to public health issues.

This direct contact with the consumer, which is now even more strategic, appears to have a dual advantage:

- in developed countries it may allow useful marketing feedback to be obtained. Furthermore, consumers increasingly want interactive relationships with and proximity to their favorite brands, particularly using their smartphones.
- in countries such as China, direct contact with the consumer also enables the latter to be reassured as to the authenticity of the product. This phenomenon is also evident in other countries such as Russia, where only 7% of Russians are

¹²⁵ Elgar Fleisch, Florian Michahelles, Felix von Reischach, *Anti-Counterfeiting 2.0 – A Consumer-Driven Approach towards Product Authentication*, Ubicomp 2007, Poster Submission, Innsbruck, 2007.

¹²⁶ Rhys Pender, "Counterfeit Wine - Its Impact on the Business of Wine", *dissertation, The Institute of Master of Wine*, March 2010, p .34.

¹²⁷ Interview with Château Latour.

satisfied with the protection provided by the Russian state against the circulation of illegal alcohol.¹²⁸

On the other hand, in China many of the players in the sector (importers, distributors, restaurants, etc.) are new and are not always able to protect the supply chain¹²⁹ as required, and therefore contact with the consumer is an option that is both robust and effective.

On a more global level, using an anti-counterfeiting technology also enables a company to position itself as an innovative leader which sends a punchy marketing message to the players in the market.¹³⁰

In summary, the suppliers of anti-counterfeiting devices must be perceived (and evaluated) not as “cost centers”, but as businesses that can benefit their customers by giving them a means of standing out on the market and a new marketing experience for their users.¹³¹

III.2.d. Business outlook

According to a recent note by the firm McKinsey¹³² the world of tomorrow will be a **connected** and **volatile world** in the long term. The consequences of such an evolution will be that the counterfeiting environment will become increasingly fragmented and complex, and businesses will have more and more difficulties in overcoming – alone – the surrounding risks of counterfeiting. Another strong trend is that **the compartmentalized distinction between the physical and the virtual world will become increasingly less relevant**. This dimension will become evident in forward-looking business practices, which will see “the end of the duality between commerce and e-commerce”¹³³ and will mark the beginning of a new era: that of “connected business”. Physical and virtual shops will be interconnected more than ever, and outwardly, thus creating a new proximity to their customers. In 2020, the mobile phone will be more central to e-commerce than it is today, but – paradoxically – having a “physical” network could well still be essential. **These interactions between the mobile and the physical network will require entrepreneurs to have great technological, logistical and marketing skills**. Consequently, the most effective anti-counterfeiting technologies will combine the two approaches flexibly and optimally. **Using the RFID-NFC option would currently appear to be the most suitable technology for such an evolution.**

The integration of digital technologies with more “physical” ones will be a strategic factor in current anti-counterfeiting technologies, and especially in future ones. The spirits sector – and also especially the fine wines sector – must therefore take this trend into account even more and become involved in this evolution, which is not just about anti-counterfeiting measures, but relates more generally to **protecting their production**. Another forward-looking feature: the use of **intelligent materials, particularly centered on the bottle**, seems

¹²⁸ Source Philippe Collier, “News Russie”, *Filactu, Contrefaçon Riposte*, 22 October 2012.

¹²⁹ Wine Intelligence, *Is your back label right for China ?*, 2013, p. 2

¹³⁰ Frost & Sullivan, *How to Win Your Anti-Counterfeiting War*, December 2011, p.11.

¹³¹ *Ibidem*, p. 17.

¹³² Bisson Peter, Stephenson Elizabeth and Viguerie S. Patrick, “The Global Grid”, *McKinsey Quarterly*, June 2010.

¹³³ Marc Lolivier in his preface of: Barba Catherine, *2020: la fin du e-commerce... ou l'avènement du commerce connecté ? [2020: the end of e-business...or the future of connected business?]*, Paris: FEVAD (French federation of e-commerce and distance selling), 2011.

to be a key factor in future anti-counterfeiting technologies for a number of observers.¹³⁴ As is often the case for this type of innovation, the cost will come down as the procedure becomes more widely marketed.

The final prediction is that anti-counterfeiting technologies will become increasingly strategic for businesses, given that the market is expected to increase from 57.4 billion dollars to 142.7 billion dollars in 2020.¹³⁵ China is expected to remain a strategic area for this problem, since alcohol sales are expected to increase in value by more than 10% per year until 2017.¹³⁶

These are all factors that will encourage a suitable degree of anticipation.

¹³⁴ Interview with César Compadre, journalist Sud-Ouest, March 2013, Château Latour and Château Margaux March 2014. Interview with Jean-Jacques Quisquater, Professor at Louvain University, March 2014.

¹³⁵ These statistics relate to packaging in the food and pharmaceuticals sector. Source: <http://www.abc12.com/story/25144017/global-anti-counterfeit-packaging-market-food-and-pharmaceuticals-technology-application-and-geography>

¹³⁶ Business Monitor, *China, Food & Drink Report*, Q1 2014, p. 23.

Conclusion

As we reach the end of our study, a few thoughts come to mind.

First and foremost we can be surprised by the lack of analysis regarding the scale of the problem. Unlike the majority of business sectors, even the customs statistics targeted at the wines and spirits sector are not accessible. It would therefore be useful to encourage international institutions (WCO, European Union, American, French and Chinese customs authorities, etc.) to publish more detailed statistics concerning wines and spirits in order to allow the comparison of seizure trends over time and by location. More detailed analysis of counterfeiting, especially in Europe, the US and above all in China, are also expected to be initiated on certain subjects: the internet, counterfeiting techniques, trends, etc.

Producers of wines and spirits have responded empirically in such circumstances. For a number of years the anti-counterfeiting campaign may have been perceived with alarm, because it was felt that drawing attention to the issue would worry consumers and the players in the wine supply chain. Yet the increase in the problem, particularly in China, has forced producers to respond. The initiatives nevertheless seem to be dispersed and fragmented and would benefit from identifying a greater number of synergies. Moreover, certain players seem to be more cutting-edge, such as the Bordeaux Grand Crus or certain spirits.

When it comes to combating the counterfeiting problem, security technologies appear to be the best option in such a volatile environment where commercial flows have become more numerous and difficult to control, particularly on Chinese territory. If, as we have shown, a choice of technology is always associated with specific problems, at the end of our analysis it would appear that the NFC solution ought to take off rapidly in the wines and spirits sector – particularly in the high-end segment. This technology is effectively part of a logical evolution in digitization in the industrial environment and also on a smaller scale. Above all, the NFC solution puts the consumer at the heart of the device as the *de facto* expert on the product and obliges producers to imagine and develop new bonds of trust with consumers. Finally, at the more organizational level, the choice of such a technology – which has wider logistical and marketing issues – also requires the fulfillment of a certain number of conditions, which we have described (importance of service and of advising the supplier, compliance with standards, digital culture of the wines or spirits producer, etc.) in order to maximize the broad potential of this new environment, which should mobilize everyone involved in the business.

Annexes

List of interviews March /April and early May 2014

- Bennett Caplan, FIVS.
- Olivier Chotard, Head of Information Systems, Château Margaux
- César Compadre, Journalist, *Sud-Ouest*.
- Eric Filiol, Head of Industrial Research and Development at the ESIEA Group.
- Hélène Génin, Technical Director Wine, Annica Haapa, head of brand protection, Château Latour.
- Thomas Jullien, representative of CIVB Asia.
- Jean-Michel Loubry, expert in traceability and protection against counterfeiting, president of the AFNOR commission on the performance of anti-counterfeiting solutions.
- Dominique Paret, NFC consultant.
- Jean-Baptiste Thial de Bordenave, Head of Lex'Wine department at Inlex.

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- David-Irving Tayer, Lawyer, Witetic.
- Marco Turchini.

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List of acronyms

AFNOR: Association Française de Normalisation.

AFSCM: Association Française du Sans Contact Mobile.

AOC: Appellation d'origine contrôlée.

BNIC: Bureau National Interprofessionnel du Cognac.

CEnTSA: Central England Trading Standards Authority.

CIVB: Conseil Interprofessionnel du Vin de Bordeaux.

CNAOC: Confédération Nationale des producteurs de vins et eaux de vie de vin à Appellations d'Origine Contrôlées.

DGCIS: Direction générale de la compétitivité, de l'industrie et des services.

DOC: Vino a denominazione di origine controllata.

DOCG: Vino a denominazione di origine controllata e garantita.

EFOW: European Federation of Origin Wines.

ESIEA: École Supérieure d'Informatique, Électronique, Automatique.

FEVAD: Fédération du e-commerce et de la vente à distance.

FIVS: Fédération Internationale des Vins et Spiritueux.

ICANN: Internet Corporation for Assigned Names and Numbers.

IFSPUK: The International Federation of Spirits Producers UK.

ISO: Organisation internationale de normalisation.

MIT: Massachusetts Institute of Technology.

NFC: Near Field Communication.

OECD: Organization for Economic Co-operation and Development.

OVD: Optical Variable Device.

QR Code: Quick Response Code.

RFID: Radio-frequency identification.

ROI: Return on Investment, Retour sur investissement.

SAV: Service après vente.

SECF: Société des Experts Chimistes de France.

SMS: Short Message Service.

UDRP: Uniform Domain-Name Dispute-Resolution Policy.

WCO: World Customs Organization.

WHO: World Health Organization.

WIPO: World Property International Organization.

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