

New evidence on wine in French international trade (1848–1913): Import discrimination as export quality promotion

Stéphane Bécuwe, Bertrand Blancheton, Samuel Maveyraud

▶ **To cite this version:**

Stéphane Bécuwe, Bertrand Blancheton, Samuel Maveyraud. New evidence on wine in French international trade (1848–1913): Import discrimination as export quality promotion. The Economic History Review, 2022, 10.1111/ehr.13156 . hal-03767178

HAL Id: hal-03767178
https://hal.science/hal-03767178

Submitted on 1 Sep 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

New evidence on wine in French international trade (1848–1913): Import discrimination as export quality promotion

Stéphane Becuwe, GREThA, University of Bordeaux;

Bertrand Blancheton, GREThA, University of Bordeaux;

Samuel Maveyraud, corresponding author, GREThA, University of Bordeaux.

Abstract:

Using an original dataset and theoretical framework, this paper offers a reinterpretation of the French wine international trade after external shocks during wine globalization based on trade policy. To maintain external position, particularly after phylloxera, French authorities promoted the development of Algerian vineyards by complex discrimination in tariffs. We highlight a negative relationship between discrimination in tariff policy and market share for wine trade partners to the detriment of Spain, Italy and Portugal and in favor of Algeria. By combining a counterfactual analysis and two theoretical models, we consider Algeria as a new competitor in an imperfect competition. Moreover, using data of wine quality at a desegregated level, we reveal that the control of imports by France allowed the diversification of the range of exports and maximisation of profits.

Keywords: Wine, International trade, Tariff discrimination, Quality, External shocks

JEL: F13, N53, N70

1. Introduction

Historiography studies several aspects of international wine trade during the first stages of globalisation, i.e.: evidence on larger exporters and trade policies,[1] specific bilateral relations,[2] increasing wine market regulation particularly at the end of the nineteenth century.[3]

Putting together the pieces of the puzzle, recent literature focuses on the emergence of a global wine market during the beginning of globalisation in a context of transaction costs, decline and a global trade boom.[4] Between 1840 and 1913 population growth, migration and infrastructure development contributed to soaring European consumption even if a large part of vineyards was decimated by the phylloxera outbreak. Old and new world producers employed diverging strategies to adapt to the changing global wine industry.[5] A dataset of the global wine market has been amassed between 1835 and 2015 and offers a new collective comparative economic history of wine globalisation.[6] In the context of trade liberalization from 1860 to the mid of 1870s, France had emerged as a leader on a new global wine market. This success is partly due to increasing quality.[7]

---

[1] See Pinilla and Ayuda, 'The political economy of the wine trade'; for Spain: Pinilla and Serrano 'The Agricultural and Food Trade'; for Italy: Federico, Natoli, Tattara, and Vasta, *Il commercio estero italiano*; for France: Becuwe and Blancheton, 'Le vin dans le commerce extérieur de la France 1850-1913'.
[2] Simpson, 'Selling to reluctant drinkers; Nye, *War, Wine, and Taxes* on UK and France.
[3] Stanziani, 'Wine reputation and quality controls'; Meloni and Swinnen, 'The Rise and Fall of the World's Largest Wine exporter'.
[4] Jacks, Meissner, and Novy, 'Trade Booms'.
[5] Simpson, *Creating Wine.*
[6] Anderson and Pinilla, Annual Database of Global Wine Markets.
[7] Ayuda, Ferrer-Pérez and Pinilla, 'A leader in an emerging new international market'; High-quality wines are increasingly identified internationally, the practice of labelling is developing (Enjalbert, *Histoire de la vigne et du vin*). A classification of Médoc and Sauternes wines was carried out at the request of the Bordeaux Chamber of Commerce for the Universal Exhibition of 1855. A map of the Côte d'Or was established by the committee of agriculture of Beaune on the occasion of the Universal Exhibition of 1862. At the same time, champagne wines were being produced, according to a vintage scale based on the harvest used.

Our paper gives new evidence on French wine market dynamics between 1848 and 1913. It shows that in a context of the phylloxera plague, French authorities promoted diversification of quality and used the Algerian vineyard as a 'satellite' to maintain leadership.

By using original desegregated data on international wine trade and highlighting original tariff discrimination, we show how France has kept its commercial position in the turbulent globalisation context. Our paper revaluates the crucial influence that sophisticated trade policy had in that setting. This French case can be introduced in debates on the persistence of the cost and benefits of colonialism.[8] It also shows how Metropoles can use their colonies to ease adjustment to domestic shocks.

During this period, the French economy was highly infused by wine production.[9] Thus, big external vineyard shocks had important potential consequences. Powdery mildew affected production very fiercely during the 1850s but the discovery of sulphur to tackle it, accelerated production recovery. Phylloxera proliferated from 1863 and progressively destroyed a large part of the vineyard (a third of the area was destroyed between 1875-89) with consequences on income and crime.[10]

The French authorities' response was multiple:[11] replant with American vine stocks immune to phylloxera, increasing imports from Spain and Italy, importing dried grapes to produce 'adulterated wines' and promoting the Algerian vineyard. Even

[8] Huilery, 'The Black Man's Burden'.
[9] See Dion, *Histoire de la vigne et du vin en France*; Lachiver, *Vin, vigne et vignerons*; Garrier, *Histoire sociale et culturelle du vin*; Simpson, *Creating Wine*; Phillips, *French Wine*; Chevet, Fernandez, Giraud-Héraud, and Pinilla, 'France'.
[10] Bignon, Caroli, and Galbiati, 'Stealing to Survive?'.
[11] Meloni and Swinnen, 'The Political and Economic History of Vineyard Planting Rights in Europe'; Meloni and Swinnen, 'The Political Economy of Regulations and Trade'.

if this promotion can be interpreted as a colonial policy success, by the way of capital influence from the metropole and spill over effects of technology transfers[12], we defend the idea that the development of the Algerian vineyard was the direct consequence of phylloxera plague in the 'Metropole'. From 1879-80, 'Algeria started the creation of a replacement vineyard'.[13] The goal of the French authorities was to recover their wine export capacity by importing Algerian wine to satisfy part of French consumption. This idea finds an echo in a debate about colonial trade policy in the '*Assemblée Nationale'*, when Maurice Rouvier[14] developed the vision that the Algerian vineyard was a Metropolitan satellite.[15]

This paper wants to give more attention to trade policies as adjustment channels in the maintaining of French leadership, indicating wine trade policy sophistication and flexibility. It offers a new empirical and theoretical interpretation: in order to recover its external position in wine, France reacted by orientating most of the domestic production to exports and expanding the range of quality. At the same time, the government drove a trade policy to sustain the development of the Algerian vineyard in order to satisfy domestic consumption in ordinary wines (in barrels). Taking into account the Algerian vineyard potential, French authorities established high discriminatory tariffs to eliminate imports from Italy and Spain, hence, they could engage in a trade war against Italy in the 1880s and 1890s and Spain in the 1890s.

---

[12] Meynier, *L'Algérie révélée*; Meloni and Swinnen, 'Algeria, Morocco and Tunisia'.
[13] Isnard, 'La viticulture en Algérie, erreur économique', p.459.
[14] Maurice Rouvier was ministry of trade and colonies (1881-82), ministry of trade (1884-85), Council President between May and December 1887. He was the promoter of an important bill of 13 March 1890 aimed at improving trade relations between France and Tunisia.
[15] 'Elle achète beaucoup. Elle a donc tout avantage à grouper autour d'elle un certain nombre de pays viticoles placés dans sa sphère d'action et qui, devenant à ce point de vue ses satellites, étendent le champ de production nécessaire pour lui permettre de répondre aux besoins qui, de toutes parts, se tournent vers elle. Tel est, depuis quelques années, le caractère du vignoble algérien ; tel doit être, toutes proportions gardées, l'avenir du vignoble tunisien', Rouvier, Session of 13 March 1890, J.O., Chambre, Documents, ord. 1890, annexe n° 439, p. 472.

This paper offers new evidence on wine quality in French international trade between 1848 and 1913 by using a new dataset founded on special trade (Base Montesquieu) by considering unit value for wine flows at the most disaggregated level (SITC digit 5). We do not voluntarily retain a gravity model[16] and favour desegregated data to analyse quality (quality index QI, based on the ratio of unit values).

By using a new bilateral trade dataset, also at the most disaggregated level, we study import protection as export promotion of Algerian wine. Our interpretation is founded on two complementary theoretical frameworks that show how import discrimination can promote entry of new competitors[17] and how product quality choices maximize profits.[18] Algerian exports of ordinary wine in barrels permitted into the French wine sector, diversifies its range of exports and improves its external position.

The article is structured as follows. Section 2 introduces the original dataset and offers some key facts on the contrast between volatility of imports and the stability of exports. Section 3 provides elements on trade policy design, the promotion of wine exports, and analyses the dynamics of the discrimination in trade policy in order to sustain the Algerian vineyard development. Section 4 presents an original analysis of wine quality founded on unit values and a reinterpretation of international wine trade after wide scale global shocks.

2. Data resources

16 The gravity model captures only imperfect trade policy strategies (Ayuda, Ferrer-Pérez, and Pinilla, 'A leader in an emerging new international market: the determinants of French wine exports').
17 Curtis, 'Trade Policy to Promote Entry with Scale Economies'; Krugman, 'Import Protection as Export Promotion'.
18 Gabszewicz, Shaked, Sutton, and Thisse, 'Segmenting the market'.

2.1. Base Montesquieu Project[19]

To analyse wine in French international trade, our main data source is the 'Tableau général du commerce de la France avec ses colonies et les puissances étrangères' ('Tableau général du commerce et de la navigation' after 1896). We only consider special trade ('commerce spécial') and not general trade ('commerce général'). Data for special trade includes the value of goods imported for national consumption and the value of national production that is exported (special trade excludes goods in transit). It is probable that at least some of the exports in transit did in fact include special trade, to reduce administrative formalities. Other common problems of old trade statistics should also be noted, including: smuggling, tourism and price valuation.[20]

For wine, the 'Tableau général' does not use the same terms for export and import. At the most disaggregated level, we can distinguish the following import products: ordinary wines in barrels, ordinary wines in bottles, liqueur wines in casks and liqueur wines in bottles.

For exports, we can distinguish the following six headings: ordinary wine in barrels from Gironde, ordinary wine in barrels from other areas, ordinary bottled wine from Gironde (this heading includes the *grands crus* following the 1855 ranking), ordinary bottled wine from other areas (this heading includes champagne between 1848 and 1892, after which point champagne appears as a separate heading), liqueur wines in casks and liqueur wines in bottles.

[19] Becuwe, S., Blancheton B. and Onfroy, K., '"Base Montesquieu" : données du commerce extérieur français (1836-1938)'.
[20] For more details, see Lampe, 'Bilateral trade flow in Europe'; Becuwe, Blancheton, and Meissner, 'Stages of diversification'.

From 1847 exports unit values are defined by the customs commission values (*Commission des valeurs en douane*). To attribute a unit value to a product, members of the commission use information from professional institutions (mainly the *Chambre de Commerce*). For import unit value, the average unit value from all partners (with weighting by quantities) appears. On this basis, we are not currently able to rank foreign partners by competitive price.

In terms of level of desegregation, a correspondence between these headings and modern SITC-5 numbers can be established. These nomenclatures can be considered as an expression of vertical product differentiation. For each product we take into account export and import values, quantities and unit values. For each of these products, data available on importations and customs duties have made it possible to calculate customs duty rates per product ($CD_{i,t}$) as follows: $= {DI_{it}}/{M_{it}}$ where DI_{it} is duties on imports of product *i* at time *t* and M_{it} is the import value of product *i* at time *t*. We also use bilateral trade data at the most desegregated level to highlight and measure discrimination in trade policy.

2.2. Key facts: exports stability vs imports volatility

The global wine market dataset and Montesquieu dataset invite us to highlight several key facts. In a long-term perspective (1836-1938), wine is in the top 4 French exports[21]. In volume, the total share of French wine exports in the world fell to approximatively to 50 per cent between 1865 and 1876 to 10-20 per cent between 1881 and WWI. But in value, the share fell also from 50 per cent before 1876 to 35

[21] Becuwe, Blancheton, and Meissner, 'Stages of diversification'.

per cent in the 1880's but rose after in a range between 40-50 per cent in the 1890s and 1900s[22]. France maintained export leadership in a context of the pandemic. Considering the stability of nominal export values (except between 1873-78), curiously no trouble seemed to have affected the French wine industry. Concentration indexes of exports (considering the number of subproducts and market diversification) appear stable.

However, imports reacted significantly after several external shocks. Wine imports went up between 1854 and 1857 and rose very rapidly between 1876 and 1886. Import concentration indexes were volatile (considering products and market diversifications). Considering these two cases, we can assume that France – during these two crises and until 1886 – chose to maintain the level of its wine exports (ordinary wine in barrels particularly from Gironde with higher quality). This production was mainly affected by economic shocks, and massively imported this same type of wine. In other words, the foreign markets were favoured over the domestic market, which was supplied by imports. Finally, it should be noted that satisfaction of the domestic market for ordinary cask wines by imports continued after the end of the phylloxera crisis.

3. New evidence on tariff discrimination

3.1. The development of Algerian vineyards

To combine an ability to maintain high quality exports and reduce dependence on Spain and Italy for lower-quality imports, French authorities decided to support the

[22] Anderson and Pinilla, Annual Database of Global Wine Markets.

development of the Algerian vineyard.[23] The literature was analysed for the rapid development of this sector[24], its industrialization at the start of twentieth century[25] as well as its spectacular decline after independence in 1962, when France imposed import restrictions and tariffs on Algerian wine.[26] After having slowed the development of Algerian vineyard, in the middle of nineteenth century, by the way of tariff policy (Algeria imports wine from the '*Midi*'[27]), the 'Metropole' decided to push an "additional vineyard" considering more largely that 'by its agriculture, Algeria is only the extension of France'.[28] In charge of the development of Algerian vineyard from 1877-83, Dejernon was carrying a political project.[29] By the 3 April 1880 law, the Bank of Algeria obtained the renewal of its privilege under the condition of supporting local vineyards. The official guide to Algerian producers, affirms that Algerian agriculture was to be developed complementary to the Metropolitan one. It defined the goal to copy Spanish wines in quantity and quality.[30]

---

[23] In 1835, imports from Algeria, a new French colony, were subject to ordinary customs tariffs, like any other country. Two ordinances in 1843, grant him a preferential right which generally represents half of the rights listed in the general tariff. The January 11, 1851 law authorizes duty-free entry. See Lavollée C., *Du régime commercial de l'Algérie*.

[24] Isnard, *La vigne en Algérie*; Meynier, *L'Algérie révélée*.

[25] Maravall L., 'Factor endowments on the 'frontier': Algerian settler agriculture at the beginning of the 1900s'.

[26] Meloni and Swinnen, 'The Rise and Fall of the World's Largest Wine exporter'; Meloni and Swinnen, 'Algeria, Morocco and Tunisia'.

[27] Isnard, *La vigne en Algérie*.

[28] Isnard, 'La viticulture en Algérie', p.458.

[29] 'Pendant que le fléau détruit un à un les plus beaux vignobles, les états voisins de la France multiplient les vignes sur leur territoire. Ils savent bien que la France, en perdant les siennes, laissera vide une place, sa place à la tête du monde commercial et industriel… Le devoir, le patriotisme des Algériens leur commandent donc de planter de la vigne' Dejernon R., cited by Isnard, 'Vigne et colonisation en Algérie', p. 289.

[30] 'Grace au régime douanier commun à la France et à l'Algérie, cette dernière ne peut guère trouver à l'étranger des débouchés, ceux-ci étant tous fermés par les tarifs actuels de douanes. (…) Certaines années, les marchés sont encombrés, et la concurrence provoque des rivalités que, dans l'intérêt de l'agriculture algérienne et des relations cordiales qui doivent exister entre la métropole et sa colonie, il importe de prévenir dans la mesure du possible. Ce résultat pourra être atteint, en partie du moins, en dirigeant l'agriculture algérienne vers la production des denrées que la métropole tire de son sol en quantité insuffisante et qu'elle est obligée de demander à l'étranger. (…) Grace aux méthodes perfectionnées de la vinification qu'ils appliquent, les viticulteurs de la colonie peuvent produire les types de vins alcooliques et colorés que le commerce demande à l'Espagne.' Lecq and Rivière, *Manuel pratique de l'agriculteur algérien*, p.153-154.

The expansion of Algerian vineyard cultivation associated with increasing wine production between 1880 and the middle of the 1900s (in 1907, 43 per cent of Algerian vineyards were affected by phylloxera) and the reduction of the French wine potential during the same period (an average of 80 per cent of Algerian wine production was exported to France) was a highlight of that period (figure 1 and figure 2).

[Figure 1 And Figure 2]

To explain the development of Algerian vineyards, we highlight the influence of trade policy. Algerian imports were not taxed by France and therefore served as a substitute for Spanish, Italian and Portuguese imports on the metropolitan market.

3.2.French wine trade policy design: a tool of discrimination

French wine trade policy design was very complex during the period depending on wine categories, alcohol degree, method of transport or countries (table 1). Between 1816 and 1853, French customs distinguished ordinary wines and liqueur wines. Ordinary wines were taxed 15 francs per hectolitre if they were imported by land and 35 francs per hectolitre by sea. Liqueur wines were taxed 100 francs per hectolitre regardless of the method of transport. As part of the liberalization strategy promoted by Napoleon III, the laws of August 30, 1854 and October 5, 1854 simplify and reduce the taxation on wines: only 25 cents per hectolitre regardless of the wine or the mode of transport. The wine trade policy was then inserted into the system of commercial treaties signed from 1860 to 1866, then extended until the beginning of the 1880s. But the low taxation level of 1854 on wine imports was not modified before 1871. The law of July 8, 1871 complicated the system. It

distinguished a so-called conventional rate of 30 cents per hectolitre regardless of the category of wine (when countries benefited from the most-favoured-nation clause (MFN clause) and a general rate applicable to countries that had not signed a Treaty (5 francs for ordinary wines and 20 francs for liqueur wines (plus 3.6 francs per 100 kg)).

[Table 1 here]

The 1881 tariff significantly tightened taxation with a conventional tariff of 2 francs and a general tariff of 4.5 and a surcharge for wines of non-European origin (3.6 francs per 100 kilograms). But the system was complicated by the possibility of signing an agreement without the MFN clause. Thus, France and Italy signed a convention on November 3, 1881 which granted preferential rights of 3 francs per hectolitre to Italian wines between the 4.5 francs of the general tariff of 1881 and the 2 francs for countries having signed a Treaty (associated with the clause). The convention was set up for 10 years but the agreement could be denounced from January 1, 1888. After consulting the chambers of commerce in 1887, France decided, in the tense context with Italy, not to renew the convention. The Franco-Italian trade war thus had as a legal point of departure: the French law of February 28, 1888 ‘modifying the general customs tariff duties with regard to a certain number of Italian products’.

In France, during the 1880s, the treaty regime was analysed as an obstacle to tariff autonomy in the global context of hardening trade policies in Europe. The MFN clause incorporated into the 1871 Frankfurt Treaty with Germany symbolized a form of commercial powerlessness. To seek to circumvent the clause, the 1881 tariff increased the number of nomenclatures. After the treaties expired in the early 1890s, they were not renewed.

The 1892 Méline tariff changed the design of trade policy (table 1 and figure 3). It had always defined a general tariff, also called 'maximum', applicable to nations not conventionally linked to France, and a so-called 'minimum' tariff, lower than the previous one, constituting the limit below which no concession can be granted within the negotiation framework of an agreement. On these bases, France agreed to bind itself to other trading powers through a preferential tariff fixed in advance by Parliament on two conditions. On the one hand, it benefited from correlative advantages and on the other hand, that its products were not subject to higher duties than those imposed on similar products from third nations. Concretely, the gap put in place between the two tariffs was to be as large as possible 'so that there was a lot to be gained from taking the minimum tariff'.

[Figure 3]

Analysis of the Méline rate shows an average difference of around 20 to 25 per cent across all numbers. For wine, to counter fraudulent practices of shipping artificial alcoholic Spanish and Portuguese wines instead, duties were based on the degree of alcohol. The general rate was set at 1.2 francs per degree and per hectolitre for 11 degrees of alcohol and the minimum rate at 70 cents per degree and per hectolitre. From 11 degrees the same system prevailed but in both cases a consumption tax on alcohol for each degree was to be added in the future[31]. During the session of June 30, 1891[32], an example was taken of an average wine grading 10 degrees. The project as defended by the Customs Commission, amounts to imposing a duty of 7 francs per hectolitre. At the same time, the duties put in place in other countries on the same wine appeared to be prohibitive (Germany: 30 francs;

[31] Nomenclature No. 171 of the January 11, 1892 law.
[32] Journal Officiel, Chambre, Débats, ord. 1891, p. 1504.

Austria-Hungary: 50 francs; United States: 60 francs; Greece, 156 francs; Romania: 100 francs; Russia, 85 francs). French parliamentarians said they were only responding to European protectionism. We observe that on these bases, the price elasticity of demand for French wines for export must be low but associated with quality wines.

In the 1890s, wine trade policy showed a great capacity for adaptation. The July 19, 1890 law granted Tunisia, a French protectorate since 1881 whose vineyard was developing (5,300 hectares in 1881 and 33,000 hectares in 1890), an intermediate regime between the franchise enjoyed by Algeria and the conventional tariff. Until then Tunisia had applied the general tariff of 1881 (maximum).

Following the Méline tariff based on the degree of alcohol, the practice of wetting was developing, in particular in Spain, which also depreciated the peseta to compensate for the increase in wine prices. The December 13, 1897, law *of the Cadena* offered greater responsiveness to trade policy by allowing the executive powers to raise all tariffs by decree. In 1898, the prices were again based on the volumes: 35 francs per hectolitre for wines of less than 12 degrees for the general price, 12 francs for the minimum price. In both cases above 12 degrees a consumption tax on alcohol was applied for each additional degree or fraction of a degree.

These complex designs explain that countries can be *de facto* taxed differently.

3.3.Discrimination and market share

Even if for one country, the wine tariff level depended on composition, we analysed the relationship between discrimination rate and market share for a panel of ten

countries[33] which were the main wine exporters to France between 1850 and 1913, to test the ability of trade policy to influence imports:

$$MS_{it} = \alpha_i + \beta \times \frac{CD_{it}}{\overline{CD_t}} + \varepsilon_{it} \ (1)$$

where MS_{it} is the market share of country i in period t. CD_{it} is the customs duty of country i in period t. $\overline{CD_t}$ is the average customs duty in period t, country i excluded and $\frac{CD_{it}}{\overline{CD_t}}$ represents the discrimination rate. If $\frac{CD_{it}}{\overline{CD_t}} > 1$ we can consider that this country is badly discriminated against.

[Table 2]

The results of the panel regression with fixed effects show that the beta coefficient is significantly different from 0 at the 1 per cent level (table 2)[34]. Moreover, they highlight that the market share is negatively related to the discrimination rate: the higher the discrimination rate, the lower the market share.

We also carry out a country-by-country analysis to assess to what extent the impact of discrimination may have had on a singular effect on imports: the coefficient of discrimination has a significantly negative impact on imports for Spain (-1.4***) and Italy (-0.73***).

Thus, the trade war offered an opportunity to develop the Algerian wine imports and to maintain high range exports from the Metropole. Now we will focus on wine quality issue.

[33] Algeria, England, Germany, Greece, Italy, Portugal, Spain, Switzerland, Tunisia and Turkey

[34] Stationarity analysis (Im-Pesaran-Shin unit-root test) reveals that variables are I(0). We also drive the same regression with one lag to check robustness: results stay similar.

3.4.Ensuring quality and promoting brand

In the last quarter of the nineteenth century, the falsification of wine was still a very widespread practice in France. The decline of French production in the context of phylloxera plague, accelerated the phenomena[35]. In contemporary terms, wetting (*mouillage*) consisted of adding water to wine intended for trade, the consumer was being deceived and the tax authorities suffered a loss of revenue. Plastering (*plâtrage*) consists in introducing potash sulfate, a traditional technique used in the South of France, the Mezzogiorno of Italy and also in Spain, into the wine to prevent the wines from turning quickly to vinegar due to sudden changes in temperature. The health of consumers was in danger here. The production of 'sugar wine' is another reprehensible practice, so it reached its peak during the phylloxera crisis and especially during the trade war with Italy (1888-1898).

In the 1880s actions were taken to improve and guarantee the quality of the wines. The definition of wine quality results in the start of stakeholder games, due to a lack of real consensus on its definition[36]. But the legislation evolved. Between 1878 and 1933 no less than seventy-seven bills and proposals for laws exclusively devoted to the fight against wine adulteration were thus counted, the vast majority of them coming from the Chamber of Deputies[37]. The most significant was the legal definition of wine via the August 14th, 1889 Griffe law, which reserves this denomination to: 'exclusive product of the fermentation of fresh grapes or fresh grape juice'. During the Madrid international conference in 1891 on brand property protection, the French government obtained that 'the designations Champagne,

[35] Serra, *Le législateur et le marché viticole sous la Troisième République*.
[36] Stanziani, 'Wine reputation and quality controls: the origins of the AOC in 19th century France'.
[37] Serra, *Le législateur et le marché viticole sous la Troisième République*.

Bordeaux, Burgundy ... cannot be applied to products other than those originating from the regions'. So, this progress would have assisted in defining new marketing strategy. Still, for the sake of information and consumer protection, the August 1st, 1905 law sought to protect appellations of origin.

Champagne producers initiated specific campaigns to promote exports and world market sharing between renowned brands. In 1882, they created an association which, after the 21 March 1884 law, became the 'union of champagne wines', bringing together 60 wine estates in 1884. They were thus specialised: Veuve Cliquot – Russia and Germany; Louis Roederer – Austria, Spain, Switzerland and Italy; Pommery – England, Sweden and Denmark[38]. During the Universal Exhibition organized by France in 1889, the champagne brands union, recently recognized by the March 21st 1884 law, was awarded a Pavilion centrally located on the Champ de Mars. It was an extraordinary showcase to show the quality of Champagne wines to the 32 million visitors from all over the world. The Champagne Union organized world market sharing between brands.

3.5.Theoretical interpretation of discrimination

We propose to give a theoretical foundation for this empirical evidence. New international trade theories assume that the presence of dynamic external economies or external economies over time, have implications for trade patterns (figure 4).

[Figure 4]

[38] Bertall, *The vine, travels around the wines of France.*

We assume that countries can be considered competitors, just like firms. Consequently, French trade policy considers all Spanish firms as one unit and all Algerian firms as another unit.

We consider two countries: Spain and Algeria. The average production cost curve of one hectolitre of ordinary wine in each of the two countries is represented respectively by *ACspain* and *ACalgeria*. *Dw* represents the global demand curve for ordinary wines that may be satisfied by Spain or Algeria. The figure shows that the average cost curve for Algeria is below that for Spain. For this reason, having a comparative advantage in terms of costs, it would be logical for Algeria to be able to satisfy world demand more readily, but this was not necessarily the case. Suppose that Spain was the first to produce wine (which is true for historical reasons). The equilibrium of the world market would therefore be in point 1 and Spain would produce quantity *Q1*, which would be sold at price *P1*. If Algeria could compete with Spain, the country would seize the world market and the equilibrium would be at point 2. However, as viticulture was being developed in Algeria, any firm faced an average cost equal to *AC1*, which was higher than the *P1* price for the older more renowned wine production in Spain. For historical reasons, due to chance, the external economies explain some of the geographical specialisations that persist without conforming to comparative advantages.

Assume that France decided to protect itself from Spanish competition by erecting a tariff on imports of ordinary Spanish wines to replace them with Algerian wine to satisfy its own domestic demand, indicated in the figure by the *Df* curve. The equilibrium for Algeria is then in point 3: the average cost curve for Algeria is at a lower level than that for Spain, and the price practiced by Algeria is lower than Spain.

Protecting from imports to promote exports is modelled by several authors.[39] Let us assume that there is a potential competitor wishing to enter the French market whose objective is to sell a substitute like that produced by the foreign monopolist – in this case Spain. This variety cannot be created without the intervention of the French government, given the presence of economies of scale and the size of the market, which are entry barriers for Algerian producers. To illustrate these hypotheses, we note that the Spanish monopolist produces and exports a product *z* whereas Algeria would like to produce an ordinary wine *y* for which the total demand *Q* is the sum of a French demand *Y* and a foreign demand *X*.

In the absence of intervention from the public authorities, the entrance of Algerian wine cannot be realised because the market is too small (figure 5).

[Figure 5]

The lack of tangency between the average cost curve (*AC*) and the total demand curve of the good (*Q*) reflects the inability of Algeria to produce wine *y*. The objective of the French public authorities is to allow Algerian wine producers to obtain normal profits by giving them a wider market. That is, the intervention of the state aims to make the total demand curve of good *y* tangent with the average cost curve. Curtis shows that the introduction of a customs tariff on imports of the leader substitute product (*t*) makes it possible to obtain this result. This does indeed move the total demand curve of Algerian wine to the right. By applying a customs duty on imports of competing wine, the government increases the domestic price of the leader product (Spanish ordinary wine in barrels) and, in view of the cross-price

[39] Curtis, 'Trade Policy to Promote Entry with Scale Economies'; Krugman, 'Import Protection as Export Promotion'.

elasticity of demand between the two types of wine, increases the demand for Algerian wine. In other words, because of the imposition of the customs duty on *z*, the French demand increases from *Y* to *Y'(p, q (1 + t))* and the total demand moves from *Q* to *Q'* to the tangency point with the average cost curve. In short, commercial policy gives the Algerian wine industry the opportunity to produce ordinary wine that will be consumed in France but also exported because there is foreign demand.

3.6.Essays in counterfactual

The counterfactual analysis consists in studying how ordinary imports of wine in barrels would have behaved in a context where the Algerian vineyard would not have been developed. For this purpose, we suggest 2 types of exploration by using both the Annual dataset of the global wine market[40] and the Montesquieu database: to what extent Spanish production of ordinary wine would have compensated for the lack of development of the Algerian vineyard in French wine imports? And, what would imports have looked like when considering the price of imports that prevailed in reaction to the aftermath of the powdery mildew contamination, when the Algerian vineyard was not yet developed?

In the first counterfactual analysis, we recalculate the consumption of French wine in barrels (volume) without the development of the Algerian vineyard according to the *k* scenario ($C^{k}_{France,t}$):

$$C^{k}_{France,t} = P_{France,t-1} - X_t + M_t + \overline{M}_{Algeria,1860-69} + m_k \times P_{Spain,t} + \Delta S \quad (2)$$

Where $P_{France,t-1}$ is the French wine production in t-1. X_t are the French exports in t. M_t represent wine imports (excluding Algeria and Spain) in t. $\overline{M}_{Algeria,1860-69}$

[40] Andersen and Pinilla, 'Annual Database of Global Wine Markets'.

is the average of imports from Algeria from 1860-69. $m_k$is the share of French imports from Spain according to the *k* scenario (*k*=low, median or high). $P_{Spain,t}$ is the Spanish wine production in t. ΔS are stock changes.

The three *k* scenarios are named the low, median and high scenarios. In the median scenario, French consumption is estimated with current Spanish imports. In the low scenario the counterfactual consumption is estimated with low Spanish imports (where we consider the average of the production shares exported to France from the 15 lowest years to calculate the level of imports). In the high scenario, the counterfactual consumption is estimated with high Spanish imports (i.e. the average of the 15 years in which the production shares of ordinary wine exported to France were the highest).

To make this result robust, we assume that part of the Spanish production could have compensated for the lack of development of the Algerian vineyard[41]. From this assumption we recalculate the volume of Spanish wine imports in barrels.

Without Algerian wine production, French consumption would have been lower during the period considered and consequently a share of French production would have had to be reserved for this domestic consumption, thus hindering France's wine export capacity (figure 6).

[Figure 6]

The second counterfactual analysis aims at evaluating the consequences of the value of imports of a non-development of the Algerian vineyard. Knowing the value of France's total barrel wine imports, the respective shares of Spanish and Algerian

[41] Considering imports from Italy or Portugal will reinforce the results of this counterfactual analysis.

imports as well as the quantities of barrel wine imports, we can deduce the unit price per kilolitre of imports and per year.

The counterfactual equation consists in the measure of imports of ordinary wine in barrels in France from Spain and Algeria in value with the average unit price in the 1850s from Spain ($M_{i,t}^{value}$):

$$M_{i,t}^{value} = M_{i,t}^{volume} \times UVM_{Spain,1854-60} \quad (3)$$

Where i = Spain or Algeria. $M_{i,t}^{volume}$ is the quantity of ordinary wine imports in barrels in France from i and $UVM_{Spain,1854-60}$ is the average unit price of imports during the 1850s from Spain.

We make the hypothesis that the demand for low quality wines being insensitive to price and estimate the evolution of wine import prices by considering that the unit prices practiced would be those observed following the powdery mildew contamination, the first major wine crisis of the nineteenth century.

[Figure 7]

Without Algerian wine, the price of barrel wine imports would have been much higher than those observed (figure 7). As a result, the recovery of the French trade balance would have been much more difficult to achieve.

4. Looking for wine qualities in international trade

The Algerian vineyard development made it possible for French wine quality to range as a strategy to absorb the major market shocks mentioned above. We observe a commitment in production and export of ordinary wines in bottles (including Champagne) and a de-specialisation in the production of ordinary wines in

barrels.[42] These changes created two main effects: the recovery of the international viticulture position and a diversification of exports that were no longer concentrated in sales outside ordinary wines in casks. In this section, we first present an original measurement of export and import quality between 1848 and 1913. We then explain the main results by theoretical analysis.

4.1. Quality measurement

We propose to measure the evolution of quality by measuring export unit value and import unit value in order to evaluate relative quality.[43] We compute export unit values for the sub-product *i*, at time *t* ($UVX_{i,t} = X_{i,t} / Q_{i,t}$), with $X_{i,t}$ export values of sub-product i at time t and $Q_{i,t}$ the quantity of sub-product i at time t to approximate the quality dynamic. We do the same thing for imports at time t ($UVM_{i,t} = M_{i,t} / Q_{i,t}$), with $M_{i,t}$ import values of sub-product *i* at time *t*.

[Figure 8]

In the 1850s, the powdery mildew shock had an impact on international wine trade (figure 8). On average, the exports increased in quality, while the quality of imports

[42] In line with Ayuda, Ferrer-Pérez, and Pinilla, 'A leader in an emerging new international market'.

[43] Ayuda, Ferrer-Pérez, and Pinilla, 'A leader in an emerging new international market'. The authors appreciate the rise in quality of French wine exports without considering their annual values and their comparison with those of imports. Their reasoning is based on the annual evolution of the quantities exported of ordinary wines in casks and ordinary wines in bottles multiplied by their respective unit value for the year 1910. This choice can be criticized. Firstly, the quality index as measured by the ratio IQ = VUX/VUM is therefore fixed. In 1910, this ratio was 6.50. One litre of ordinary bottled wine exported is therefore worth 6.5 litres of imported wine of the same type. This very high value can be explained by the exports of Champagne, for which we know the precise quantities exported and their unit price from 1894 onwards. Previously, these were undoubtedly lower because they were not distinguished from the category of ordinary bottled wines. Secondly, the authors apply this same 1910 export unit price to the quantities for all years, including those in which Champagne was not exported. It creates a significant difference between the export values of ordinary bottled wines at current prices and at constant 1910 prices, as can be seen in the following graph. This difference is very significant between 1972 and 1893.
Figures in appendix 2 compare the quality indexes (VUX/VUM) of ordinary bottled wines in current francs and 1910 francs. This last choice leads to obscuring the rise in quality that can be observed from 1886 onwards in connection with the growth of Champagne exports. Previously, the relative quality of French wines compared to foreign wines was stable, as was the fixed quality of 1910, but at a much lower level. The quality indexes (VUX/VUM) of ordinary bottled wines in current francs and 1910 francs were stable.

decreased. Between the middle of the 1850s and World War I, export unit values were significantly higher than import unit values. A focus on unit values for exporting and importing at a more desegregated level is possible with our dataset (Appendix 1 proposes unit values for the other categories of wine).

[Figure 9]

For ordinary bottled wines the difference between the two curves remains low and constant between the mid-1860s-86 (figure 9). In 1886, the unit value for ordinary wines in imported bottles fell drastically, while rising for exported wines, first slightly and then, after 1893, significantly. This sharp rise is explained by the large quantity of champagne exports, whose unit value is very high.

The difference between the two-unit value curves is a acceptable indicator of the relative quality of the exported products compared with similar imported products: the higher the gap, the greater the difference in quality. We therefore suggest defining the quality index as the ratio between the unit value of exports and imports. The quality index QI can therefore be defined as UVX/UVM.

Regardless of the category of wine considered, the quality index increased after 1886 (figure 10).

[Figure 10]

However, this growth was of greater magnitude for ordinary wines in bottles. Ten years later, a bottle of ordinary wine exported was worth seven bottles of imported wine. Champagne explains a large part of this difference. To further explain the quality index dynamics, we suggest that its evolution can be determined by two elements: international competition and the level of protection.

4.2.The role of international competition and protection

The pressure of international competition may lead domestic producers to move upmarket. We consider the intensity of intra-industry trade (IIT), measured by the Grubel and Lloyd index, as a good indicator of international competition.[44] We expect a positive link between the QI and the intensity of IIT.

A high level of protection, measured by the average tariff (CT), by raising the price of imports of similar products on the domestic market, momentarily shelters domestic producers from foreign competition and may encourage them not to change the quality of their products. The expected relationship between QI and CD is therefore negative.

We ran the following regression over the period 1848–1913 (the data is expressed in logarithms):

$$QI_t = b_0 + b_1 \times year + b_2 \times ITT_t + b_3 \times CD_t + \eta_t \qquad (4)$$

The results of econometric regression are shown in table 3. The expected signs for both variables were obtained. Competitive pressure and degree of protection appear to be key factors in explaining the evolution of the wine QI.

[Table 3]

4.3.Consequences of the move upmarket for the purchasing countries

French wine was exported to an average of 54 countries over the period 1848–1913. For each of these destinations and for each year, we have noted the volume and value of the wines exported in all categories (at level 3 of the SITC). This original

[44] In reference to Becuwe, Blancheton, and Meissner, 'Stages of diversification: France, 1836-1938'. *European Review of Economic History*.

detailed database contains 6,976 elements of data. For each country, it is possible to calculate a unit value for French wines exported. Obviously, this unit value differs according to the country of destination. The composition by export subcategory exports explains the differences. The annual calculation of the variance of these unit values gives a dispersion measurement of wine export composition among the recipient countries.

Commitment from 1886 to the export of ordinary bottled wines coincided with the very strong growth in the variance of export unit values according to the country of destination (figure 11).

[Figure 11]

The correlation between the two curves is significant and positive ($r = 0.61$). The move upmarket had the effect of increasing the dispersion of the unit values. Some client countries were not all able to buy French wines such as champagne, while others could. This segmentation among the purchasing countries is found through the increase in the variance of unit values for export.

4.4. Vertical differentiation and segmentation of external markets: A theoretical interpretation

As shown in this section, the second step for the strategy adopted by France was to choose combinations of wines to be exported and sold on segmented external markets to maximise export earnings. France increasingly diversified its wine exports starting from 1886. These were gradually divided between the two categories of wines with low and high qualities: ordinary wines in casks and ordinary wines in bottles. This observation follows from the unit export values of the different categories of wine (figures A1 to A3). We will later see that the choice

to export this combination of extreme qualities, corresponding to maximum differentiation, is theoretically justified.

To establish the link with the previous point, it was necessary that the ordinary Algerian wines satisfy the French demand to allow the ordinary wines in French casks to compete with their Spanish substitutes on the foreign markets. In this lower quality market segment, it was better to share a duopoly profit with Spain than to give it a monopoly on the sale of this type of wine. At the same time, in these same markets, France exported top quality wines, ordinary wines in bottles, including champagne, for this niche, France held a monopoly position. This situation can be founded theoretically on the models of vertical differentiation. More precisely, we propose to base our analysis on Gabszewicz's model,[45] where we consider the firm as a country.

Gabszewicz's model analyses the choice of product qualities that a monopolist wishes to sell, and at what prices, to a population of consumers who differ in income. If it is no more costly to produce a higher quality product, the country may tend to offer just one product, the highest quality possible, as consumers' willingness to pay increases with quality. In this case, the product would be purchased by all consumers whose income exceeds that of the marginal consumer whose reserve price coincides with the price chosen. This suggests that richer consumers have some surplus, but also that if the company should offer more than one quality, by charging more for higher quality, it could extract some of this consumer surplus. The authors show that income dispersion is the crucial variable. If the range of incomes is narrower, it is optimal for the monopolist to offer only

[45] Gabszewicz, Shaked, Sutton, and Thisse, 'Segmenting the market'.

the top-quality product. If, on the other hand, revenues are more dispersed, it is in the interest of the country to segment the market by offering several products of different quality.

Before 1886, France almost exclusively exported ordinary wine in barrels. The diversification of quality did not arise yet. On foreign markets, France was in competition with other producers of this type of wine. Competition therefore took place in a product space differentiated not vertically but horizontally. Consumers bought a variety of this type of wine. This situation can be illustrated by a line of length 1 on which the consumers are evenly distributed.[46] Their choice concerns the characteristics of the varieties proposed. It is likely that France was in competition with the same countries that export this type of wine to France – that is, Spain, Italy, Portugal, Greece, Turkey, and Austria. We exclude Algeria because its exports in this category of wine were almost exclusively absorbed by the French internal market. It is difficult to say whether the market structure was more like a differentiated oligopoly or a monopolistic competition. Similarly, it is difficult to position French wine in the product space. However, an examination of Figure A1 in appendix 1 indicates that the unit value for the export of one hectolitre of ordinary wine in French casks was greater than the unit value of one hectolitre of the same type of wine imported by France. The latter value is a weighted average of unit values by quantity from different countries, which are not shown in France's foreign trade statistics tables, but are obviously not equal. Given that most of the imports came from Spain, it can be assumed that French wine is on the left of Spanish wine

[46] Hotelling, 'Stability in competition'.

on the linear scale where the different varieties of ordinary wine in casks of various geographical origins are positioned.

The export unit value variance curve of French wines destined for all customer countries is flat and very low between 1875 and 1886[47] (France exported its wine to 50 countries in 1875 and 52 in 1886) (figure 11). This is consistent with the idea that when differentiation is horizontal, markets are not segmented, and consumer discrimination is not possible. Regardless of the client country and given the market structure, the price charged could hardly vary, so the variance of export unit values for all countries was low and stable (the variance was 0.09 in 1875 and 0.05 in 1886). It seems obvious that this export strategy could not correct an external situation collapsed due to the phylloxera crisis.

After 1886, France diversified its exports and offered two types of wine of different quality on the external markets: ordinary wine in casks and ordinary bottled wine. On each external market, consumers had the choice between two qualities of wine. The difference was that in the low-quality wine market segment, the market structure was close to monopolistic competition, whereas in the high-quality wine market segment, France was the only one to offer this type of wine. It was likely that the ordinary wines offered by France were positioned near the border that separates the two market segments. To prevent the wine of higher quality from being too close to the characteristics of ordinary wine in casks, it was in the interest of France to offer consumers located in this market segment the highest quality wine, in accordance with to the predictions of the Shaked and Sutton's model,[48]

[47] It should be recalled that the data used to calculate this dispersion index are based on the census of value and quantities expressed in hectolitres of wines exported by France to all purchasing countries at the aggregate level of the contemporary nomenclature. This level, which corresponds to level 3 of the SITC, therefore includes the four categories of wine listed at the most disaggregated level.

[48] Shaked and Sutton, 'Relaxing Price Competition Through Product Differentiation'.

where vertical differentiation must be maximal. This is what happened from 1893, when France exported two qualities of wines: ordinary wine in barrels and champagne, of which France holds the monopoly of production.

France exported these two types of wine to many countries that differed in the level of their income and the egalitarian nature of its distribution (table 4). The variance of unit values for exports to all countries rose after 1886 and then increased even more clearly after 1893, when France applied the strategy of maximum vertical differentiation, which allowed the country to redress its external position (figure 11)[49].

[Table 4]

5. Conclusion

Recent rich literature focuses on wine market globalisation[50] and integration dynamics in a context of transaction costs decline.[51] It highlights French leadership on the world market by the way of quality of exports.[52] However, literature does not explain why and how to upgrade this quality.

Our paper shows how France used Algeria from the beginning of 1880s as a satellite to adjust domestic shock (phylloxera). By using discriminatory trade policy, France replaced Spanish and Italian wine by new Algerian imports. Regular imports of ordinary wine from Algeria permitted France to maintain exports capacity. At the same time, French authorities ensured wine quality by law and by supporting

[49] Knowing neither the per capita income of the different client countries nor their Gini coefficient, it is impossible to determine the optimal quantities of each type of wine that France exported to the different countries.
[50] Anderson and Pinilla, 'Annual Database of Global Wine Markets'.
[51] Simpson, *Creating Wine*. Anderson, Meloni, and Swinnen, 'Global alcohol markets'.
[52] Ayuda, Ferrer-Pérez, and Pinilla, 'A leader in an emerging new international market'.

producers in setting up branding, particularly in Champagne[53]. This set of measures enabled France to maintain its leadership on wine global market.

Analysing policy design in detail, our paper shows how French authorities aim to control French international wine trade between 1848-1913. We establish a significant negative correlation between market share and discrimination in trade policy.

Using two original datasets, we offer a more precise measure of quality exports and compare it with imports quality, particularly with European competitors. Building a quality index by wine categories and applying a theoretical framework in industrial economics to international one, we show that the trade policy has made it possible to move upmarket. We established a positive correlation between Quality Index and Intra-Industry Trade (considered as a proxy of international competition) and a negative significant correlation with tariff.

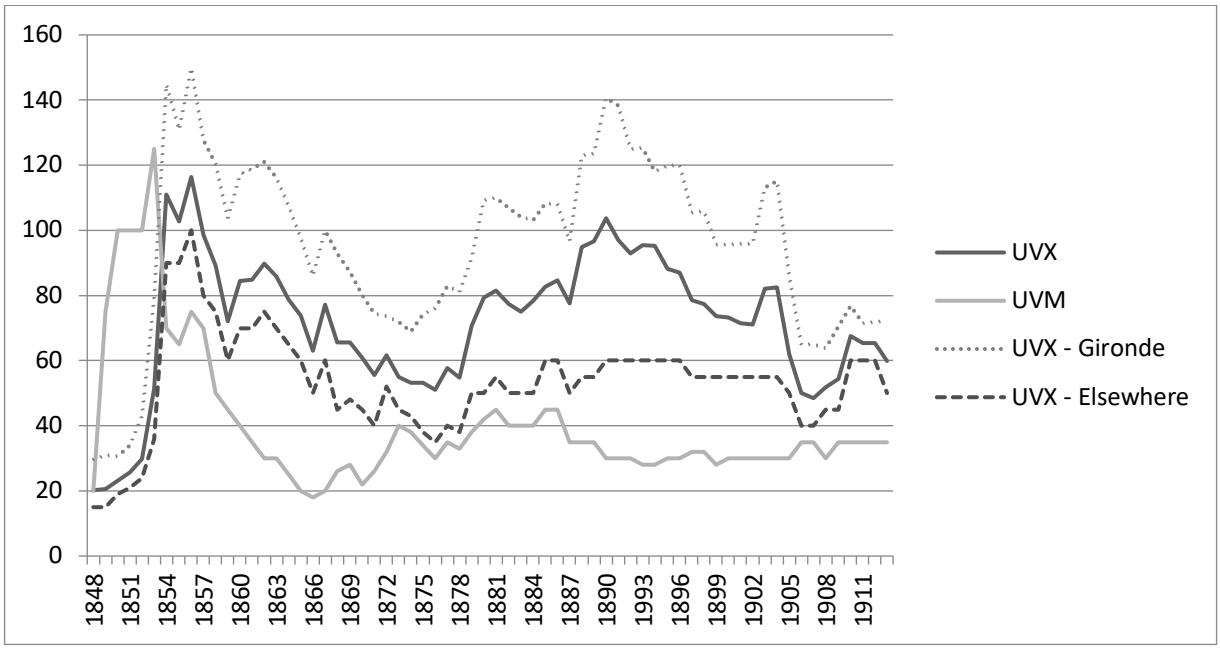
These results offer a new interpretation of French strategy on the world wine market founded on new empirical resources and two complementary theoretical frameworks.[54] After the phylloxera epidemic, to recover its external position, France reacted by orientating domestic production to exports and expanding the range of quality. To provide for domestic consumption of ordinary wine in barrels, the French government introduced discrimination in imports and drove trade policy to sustain the development of Algerian vineyards but only as an additional and complementary vineyard. Algeria helped ease the adjustment to domestic shock.

[53] See Guy, *When Champagne Became French*; Wolikow and Wolikow, *Champagne !.*
[54] Curtis, 'Trade Policy to Promote Entry with Scale Economies'; Krugman, 'Import Protection as Export Promotion'. Gabszewicz, Shaked, Sutton, and Thisse, 'Segmenting the market'.

This striking example can highlight contemporary debates on the persistence of cost and benefits of colonialism for the metropole.

Appendix 1

Figure A1 Exports and imports unit values for ordinary wine in barrels



Ayuda et al (2019) do not use annual export values. They have multiplied the quantities exported in hectoliters of two big type of wine by its unit value in 1910. Figure A1 shows that the choice of 1910 is crucial. French customs statistics distinguish two types of ordinary barrel wines, those from Gironde and those from elsewhere. In 1910, the unit value of a hectoliter of Gironde wines cost 1.28 times that of elsewhere. On average over the period 1848-1913, this ratio was equal to 1.81 and even reached 2.34 in 1890. We cannot therefore consider the category of ordinary cask wines as homogeneous. These two types of ordinary wines have very different prices and are therefore of different quality. This choice also leads to underestimating the value of exports of ordinary wines exported to countries mainly buying Gironde wine, as is the case for England, the United States, Russia, ... Also the data in Ayuda et al (2019, table 1 p. 7) concerning the destination of exports of ordinary wines are, in our opinion, incorrect.

Figure A2 Exports and imports unit values for liqueur wine in barrels

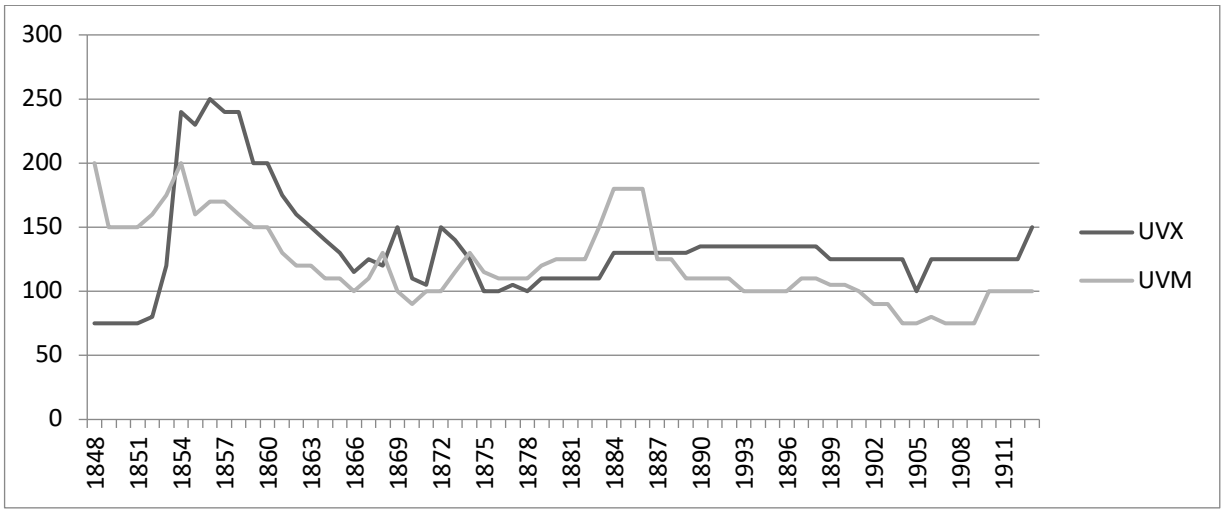
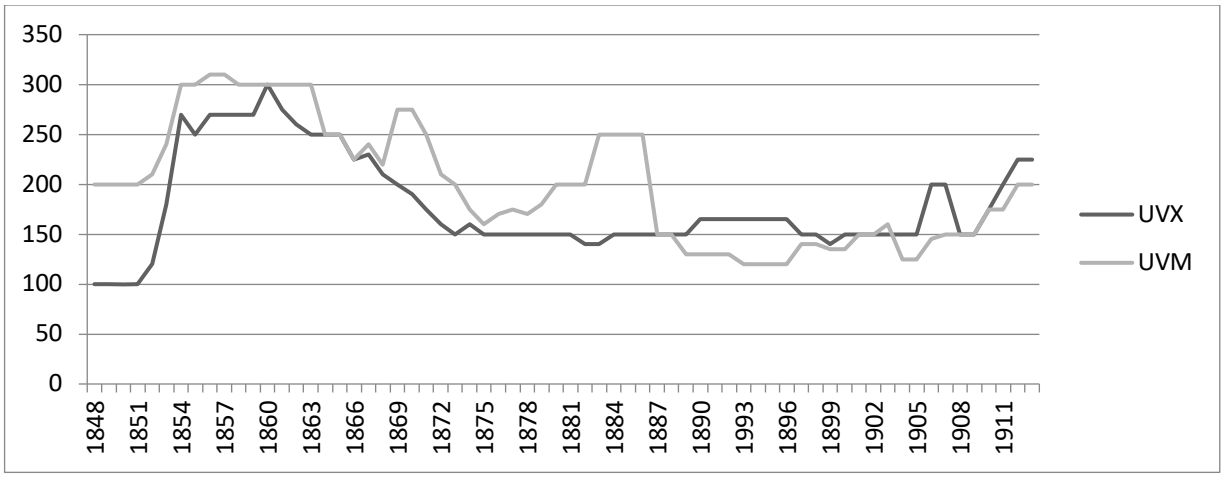


Figure A3 Exports and imports unit values for liqueur wine in bottles



Appendix 2

Figure A4: Ordinary bottled wine in current prices and in 1910s prices

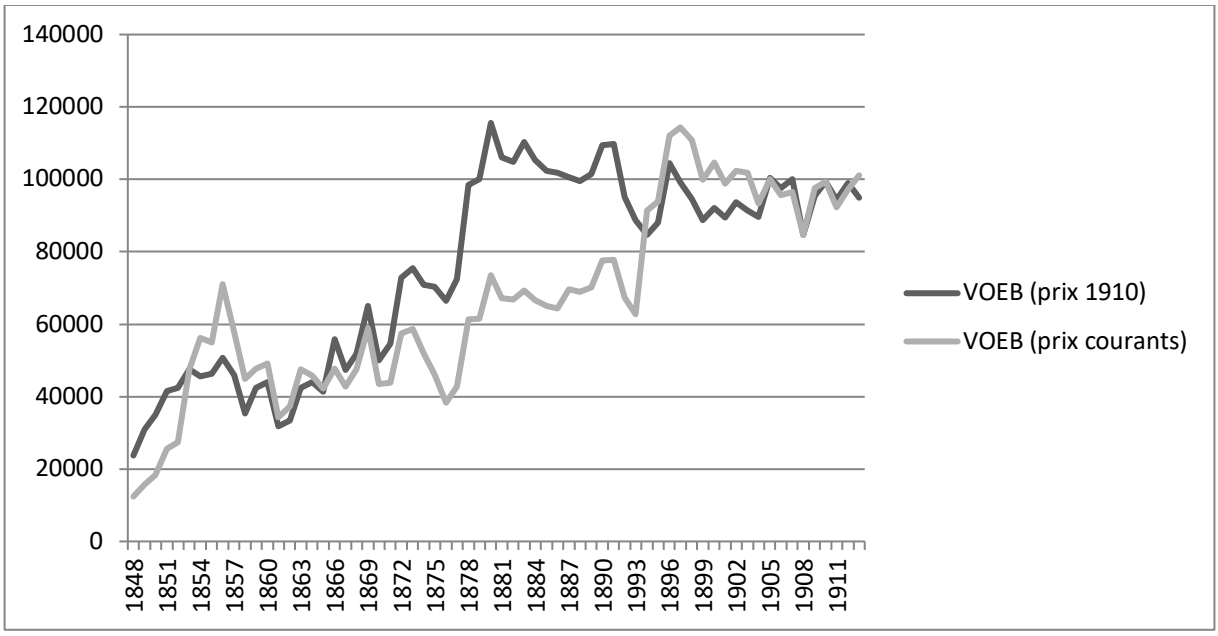
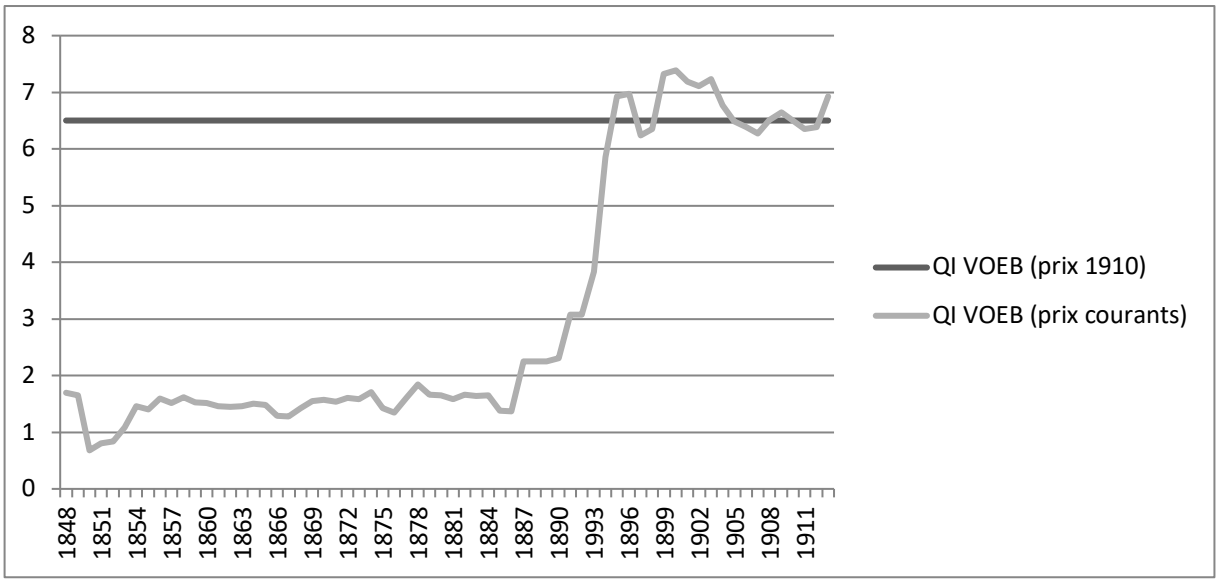


Figure A5: quality indexes of ordinary bottled wine in current francs and 1910 francs



References

Anderson, K., Meloni, G. and Swinnen, J., 'Global alcohol markets: evolving consumption patterns, regulations, and industrial organizations', *Annual Review of Resource Economics*, 10 (2018), pp. 105–32.

Anderson, K. and Pinilla, V., 2017. 'Annual Database of Global Wine Markets, 1835 to 2015', www.adelaide.edu.au/wine-econ/databases; Adelaide.

Anderson, K. and Pinilla, V., *Wine Globalization: a New Comparative History*, (Cambridge University Press, 2018).

Asselain, J-C., 2010. 'Vins de prestige et vignoble de masse. Regards croisés', in *Histoire, théorie et pratique du droit. Etudes offertes à Michel Vidal*, PUB, Bordeaux, pp.53-98.

Ayuda, M-I., Ferrer-Pérez H., and Pinilla V., 'A leader in an emerging new international market: the determinants of French wine exports, 1848–1938', *Economic History Review*, (2019), https://doi.org/10.1111/ehr.12878

Becuwe, S. and Blancheton, B., 'Le vin dans le commerce extérieur de la France 1850-1913', *Economies et Sociétés, Série AF* n°47 (2013), pp. 1555-72.

Becuwe, S. and Blancheton, B., 'The dispersion of customs tariffs in France between 1850 and 1913: discrimination in trade policy', *Research in Economic History*, 30 (2014.), pp. 163-183.

Becuwe, S., Blancheton, B. and Meissner, C., 'Stages of diversification: France, 1836-1938', *European Review of Economic History*, 22 (4) (2018), pp. 430-461.

Becuwe, S., Blancheton B. and Onfroy, K., '"Base Montesquieu*"* : données du commerce extérieur français (1836-1938)', *Revue de l'OFCE*, 164 (2019), pp. 87-109.

Bertall (C.A. d'Arnoux dit), *The vine, travels around the wines of France*, (Plon, 1878).

Bignon, V., Caroli, E. and Galbiati, R. 'Stealing to Survive? Crime and Income Shocks in Nineteenth Century France', *The Economic Journal*, 127 (201 7), pp. 19-49.

Chevet, J. M., Fernandez, E., Giraud-Héraud, E., and Pinilla, V., 'France', in K. Anderson and V. Pinilla, eds., *Wine globalization: a new comparative history*, (Cambridge University Press, 2018), pp. 55-91.

Curtis, D. C. A., 'Trade Policy to Promote Entry with Scale Economies, Product Variety, and Export Potential', *The Canadian Journal of Economics,*16 (1983), pp. 109-121.

Dejernon, R., *Les vignes et les vins de l'Algérie* (Librairie Agricole de la Maison Rustique, 1884).

Dion, R., *Histoire de la vigne et du vin en France, des origines au XIXe siècle* (Clavreuil, 1959).

Enjalbert, H., *Histoire de la vigne et du vin. L'avènement de la qualité.* (Bordas, 1975).

Federico, G., Natoli, S., Tattara, G., and Vasta M.A., *Il commercio estero italiano 1861-1939* (Laterza, 2012).

Gabszewicz J J., Shaked A., Sutton J., and Thisse J-F., 'Segmenting the market: The monopolist's optimal product mix', *Journal of Economic Theory,* 39 (1986), pp. 273-289.

Gale, G., *Dying on the Vine: How Phylloxera Transformed Wine*, (University of California Press, 2011).

Galet, P., *Cépages et vignobles de France*. 4, *Les raisins de table La production viticole français* (Imprimerie du Paysan du Midi, 1964).

Garrier, G., *Le phylloxéra : une guerre de trente ans 1870– 1900* (Albin Michel, 1989).

Garrier, G., *Histoire sociale et culturelle du vin*, (Bordas, 1995).

Guy, K.M., *When Champagne Became French. Wine and the Making of a National Identity* (Johns Hopkins University Press, 2007).

Hotelling H., 'Stability in competition', *The Economic Journal*, 39 (1929), pp. 41-57.

Huillery, E., 'The Black Man's Burden: The Cost of Colonization in French West Africa', *Journal of Economic History,* 74 (2014), pp. 1–38.

Isnard, H., 'Vigne et colonisation en Algérie (1880-1947)', *Annales. ESC*, 2 (1947.), pp. 288-300.

Isnard, H., *La vigne en Algérie. Etude géographique*, 2, (Ophrys, 1954).

Isnard, H., 'La viticulture en Algérie, erreur économique', *Revue Africaine*, 6 (1956), pp. 437-473.

Jacks, D.S., Meissner C., and Novy, D., 'Trade booms, trade busts, and trade costs', *Journal of International Economics*, 83 (2011), pp. 185-201.

Krugman, P., ‘Import Protection as Export Promotion: International Competition in the Presence of Oligopoly and Economics of Scale’. in H. Kierzkowsk, ed., *Monopolistic Competition and International Trade*, (Clarendon Press Oxford, 1984), pp.180-193.

Lachiver, M., *Vin, vigne et vignerons : histoire du vignoble français*, (Fayard, 1988).

Lampe M., ‘Bilateral trade flow in Europe, 1857-1875’, *Research in Economic History*, 26 (2008), pp. 81-156.

Lavollée, C., ‘Du régime commercial de l’Algérie’, *Revue des Deux Mondes*, 17 (4) (1858), pp. 880-902.

Lecq, H. and Rivière, C., *Manuel pratique de l’agriculteur algérien : grandes cultures, céréales, vignes, pâturages, élevage du bétail, horticulture, arboriculture, économie rurale, hygiène, matériel et constructions agricoles, suivi d’un calendrier du cultivateu*r (Bibliothèque d’agriculture coloniale, 1900).

Loubère, L., *The Wine Revolution in France: The twentieth century* (Princeton University Press, 1990).

Maravall L., ‘Factor endowments on the 'frontier': Algerian settler agriculture at the beginning of the 1900s’, *Economic History Review*, 73 (3) (2020), pp. 758-784.

Meloni, G. and Swinnen, J., ‘The Rise and Fall of the World’s Largest Wine exporter – and Its Institutional Lagagy’, *Journal of Wine Economics*, 9 (2014), pp. 3-33.

Meloni, G. and Swinnen, J., ‘The Political and Economic History of Vineyard Planting Rights in Europe: From Montesquieu to the European Union’, *Journal of Wine Economics*, 11 (2016), pp. 379-413.

Meloni, G. and Swinnen, J., 'The Political Economy of Regulations and Trade: Wine Trade 1860–1970', *World Economy*, 41 (2018-a), pp. 1567-1595.

Meloni, G. and Swinnen, J., 'Algeria, Morocco and Tunisia', in K. Anderson and V. Pinilla, eds., *Wine globalization: a new comparative history* (Cambridge University Press, 2018-b).

Meynier, G., *L'Algérie révélée : la guerre de 1914 –1918 et le premier quart du XXe siècle* (Droz, 1981).

Nye, J. V., *War, Wine, and Taxes: The Political Economy of Anglo-French Trade, 1689–1900* (Princeton University Press, 2007).

Phillips, R., *French Wine: A History* (University of California Press, 2016).

Pinilla, V. and Ayuda, M-I., 'The political economy of the wine trade: Spanish exports and the international market, 1890–1935', *European Review of Economic History*, 6 (2002), pp. 51-85.

Pinilla, V. and Serrano, R., 'The Agricultural and Food Trade in the First Globalization: Spanish Table Wine Exports 1871 to 1935 – A case study', *Journal of Wine Economics*, 3 (2008), pp. 132-48.

Serra, O., *Le législateur et le marché viticole sous la Troisième République*, thèse pour le Doctorat en Droit, Bordeaux, 2012.

Simpson, J., 'Selling to reluctant drinkers: the British wine market, 1860-1914', *Economic History Review*, 57 (2004), pp. 80-108.

Simpson, J., *Creating Wine: The Emergence of a world Industry, 1840-1914* (Princeton University Press, 2011).

Shaked A. and Sutton J., 'Relaxing Price Competition Through Product Differentiation', *Review of Economic Studies,* 49 (1982), pp. 3-13.

Stanziani, A., 'Wine reputation and quality controls: the origins of the AOC in 19th century France', *European Journal of Law and Economics*, 18 (2004), pp. 149-167.

Wolikow, C. and Wolikow, S., *Champagne ! Histoire inattendue* (Les éditions de l'Atelier, 2012).

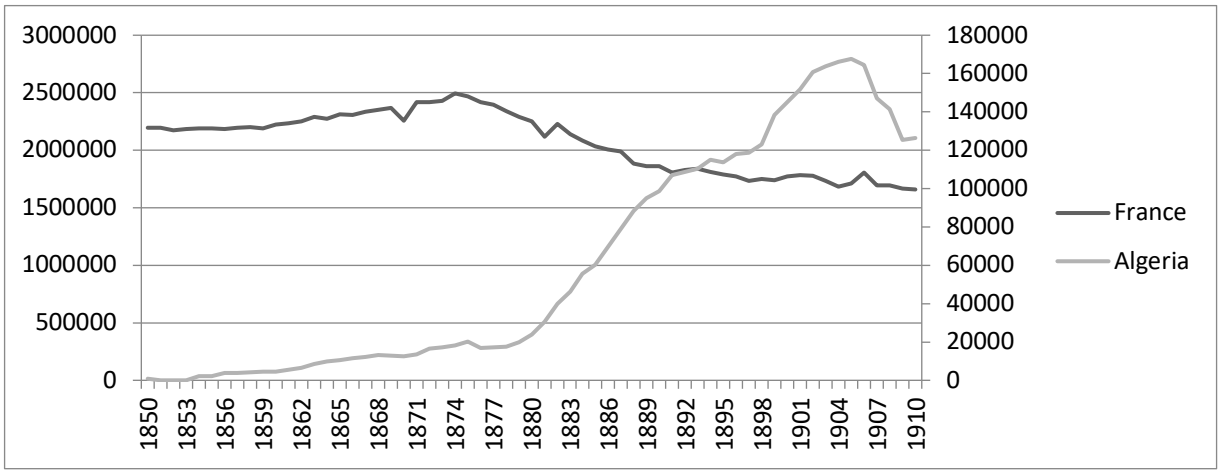
Official publications

Journal Officiel, Chambre, Débats, ord. 1891, p. 1504.

Journal Officiel, Chambre, Documents, ord. 1890, annexe n° 439, p. 472.

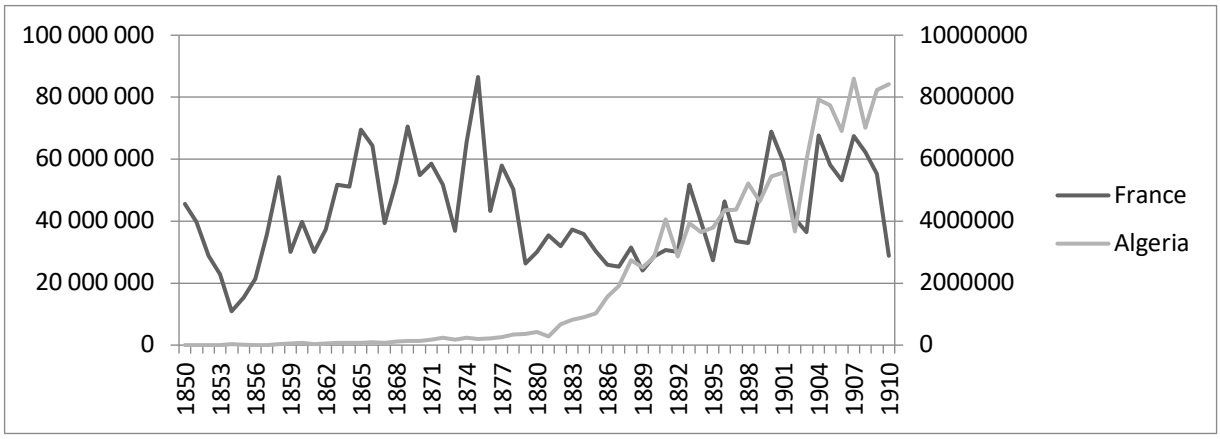
Nomenclature No. 171 of the January 11, 1892 law.

Figure 1: Area of French and Algerian vineyards (in hectares)



Source: Anderson and Pinilla (2017). Note: Left scale: France; Right scale: Algeria

Figure 2: Wine production in France and Algeria (in hl)



Source: Anderson and Pinilla (2017). Note: Left scale: France; Right scale: Algeria

Figure 3: Custom dusties by hectoliter

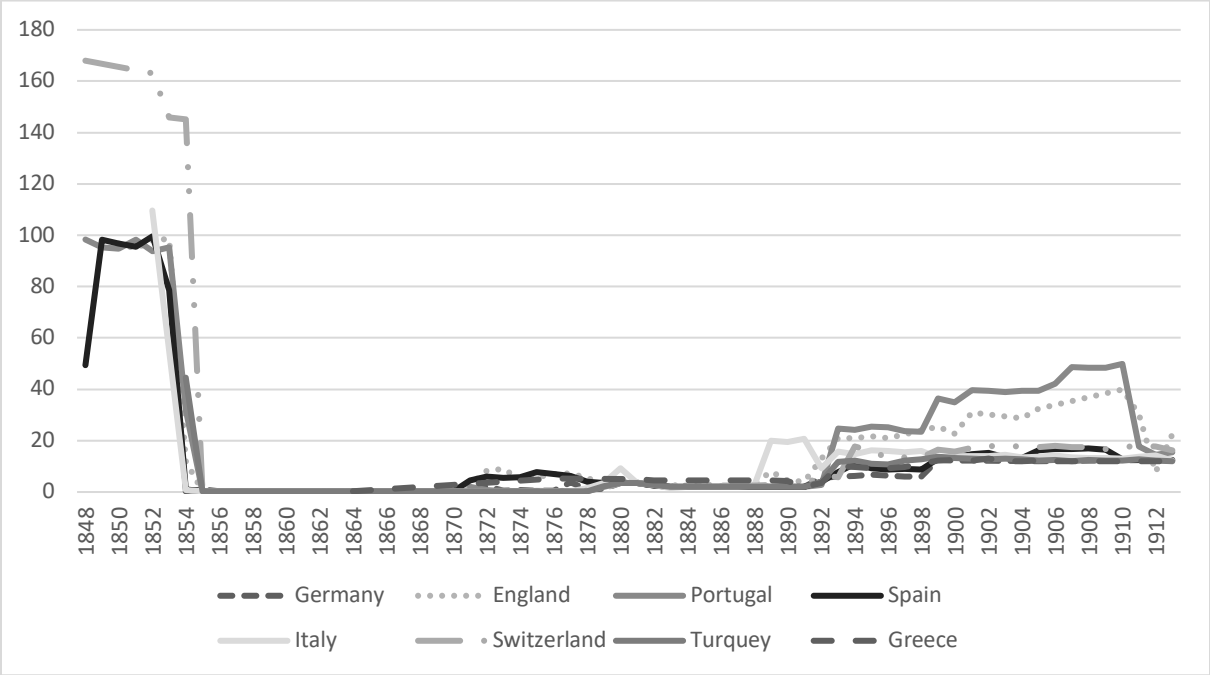


Figure 4: External economies and trade patterns

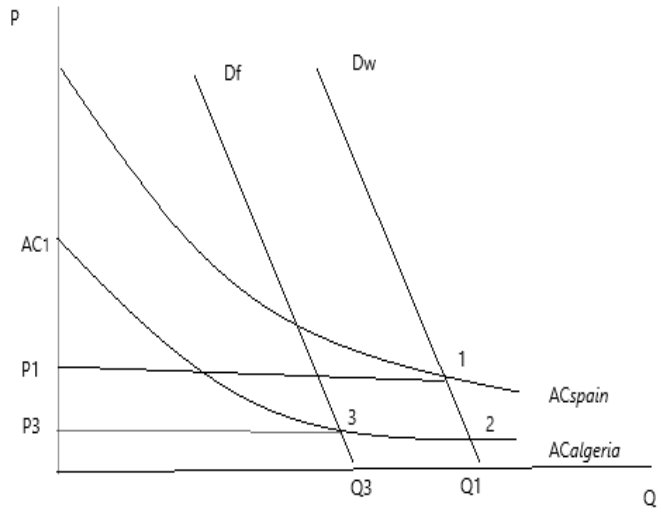
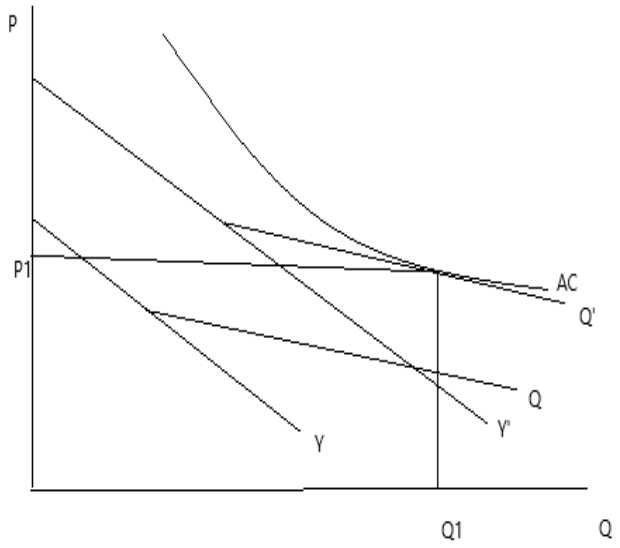


Figure 5: Entry conditions for Algerian wine to the French market



Note: *Y* is the French demand for potential Algerian wine, and *Q* the total demand as a function of *p*, the price of this product and *q*, the price of the substitute produced by the Spanish monopolist, *y (p, q)* and *Q (p, q)*. *AC* represents the average cost of one hectolitre of wine by the potential Algerian entrant.

Figure 6: Counterfactual French consumption (1860-1913)

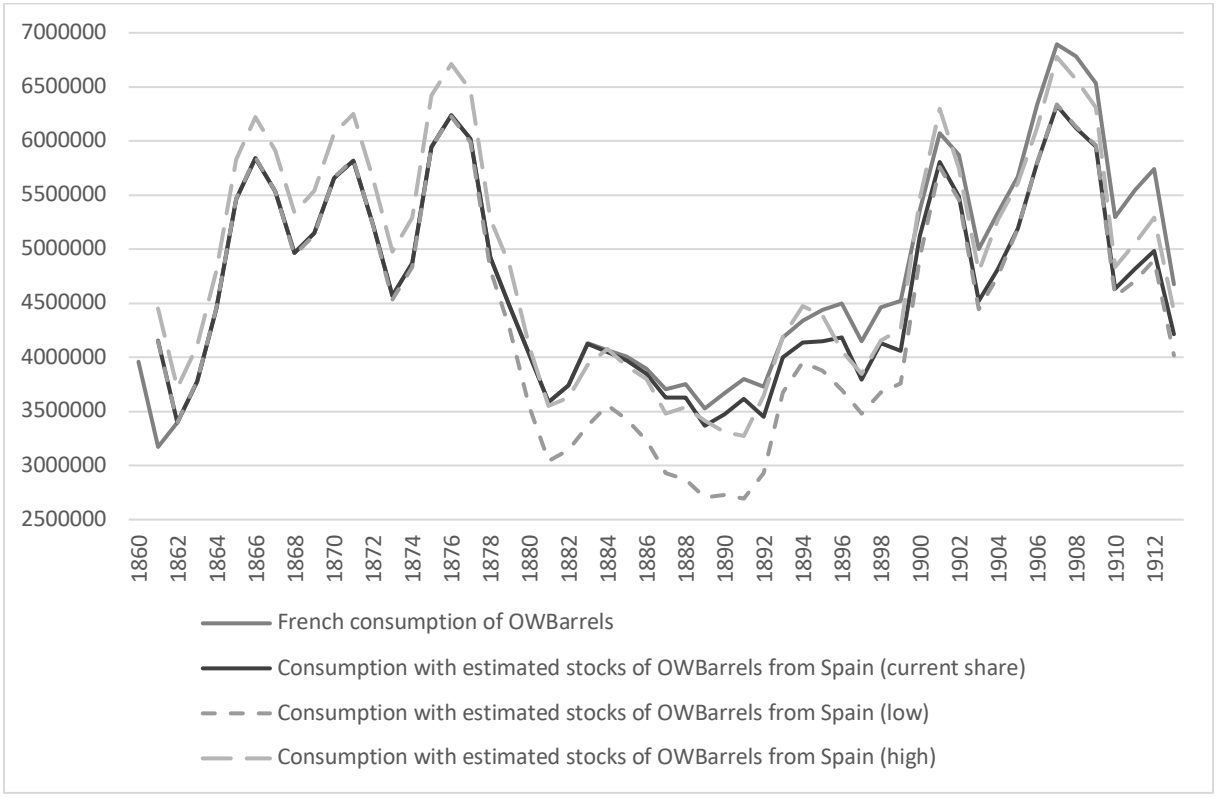


Figure 7: Counterfactual analysis of imports (in value) (1860-1913)

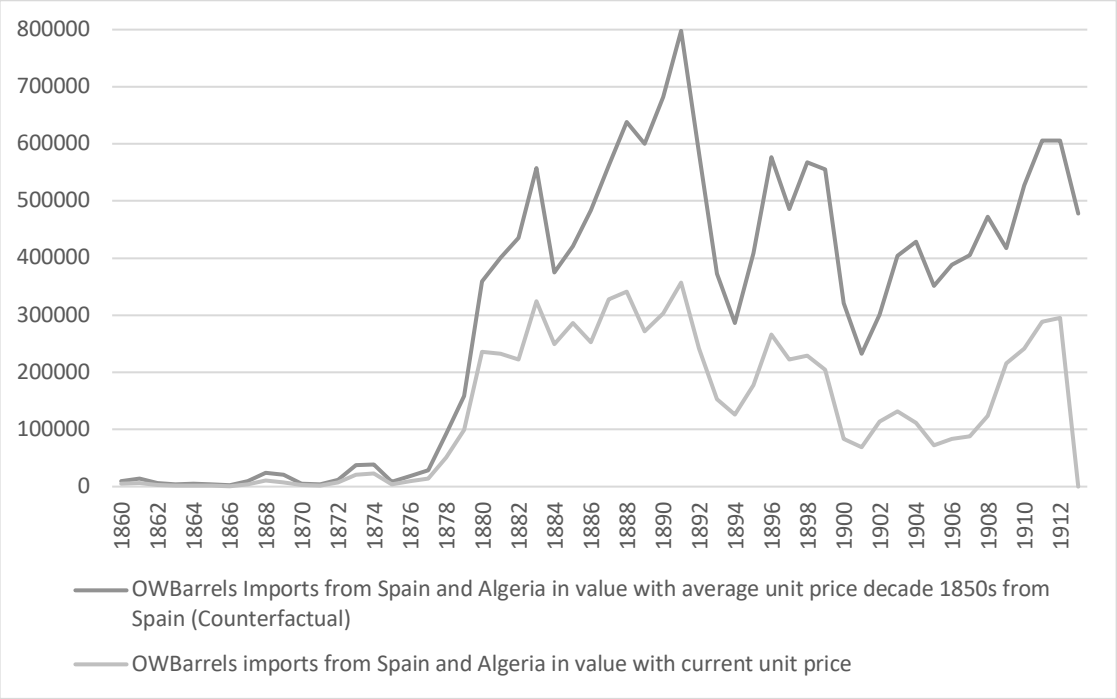
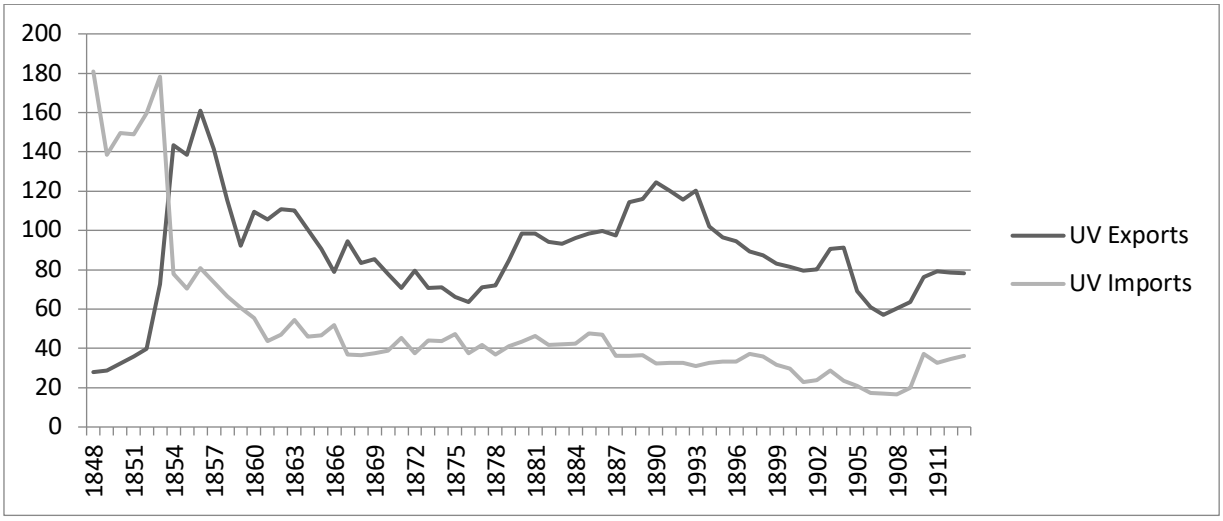


Figure 8: Export and import unit values for all categories of wine



Note : $UV_{i,t}$ exports are defined as $\sum_i \ XUV_{it} \times \frac{X_{it}}{\sum_i \ X_{it}}$; $UV_{i,t}$ imports are defined as

$\sum_i \ MUV_{it} \times \frac{M_{it}}{\sum_i \ M_{it}}$.

Figure 9: Export and import unit values for ordinary bottled wine

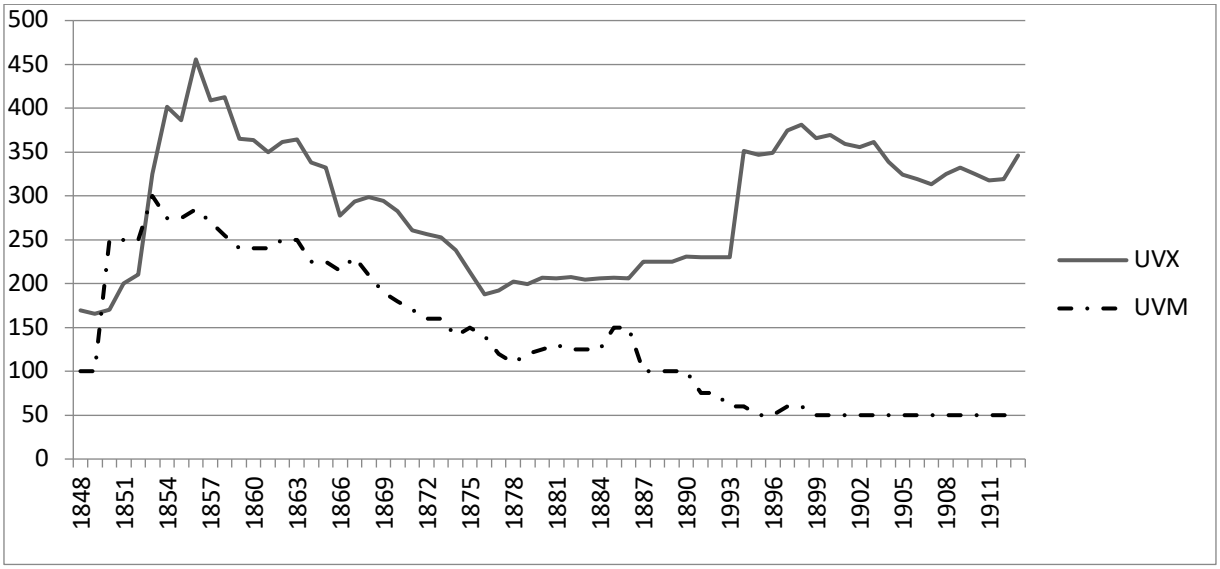
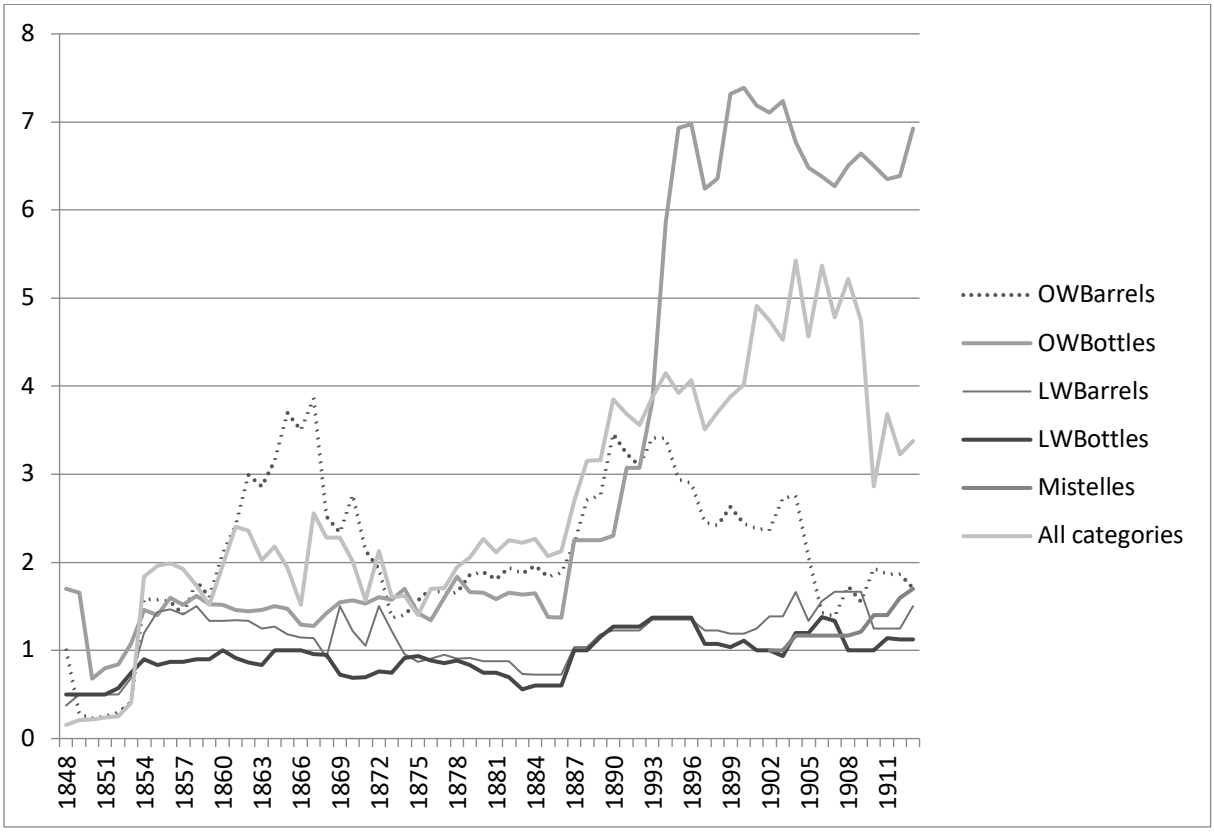


Figure10: Quality index by category



Note: $QI = UVX/UVM$

Figure 11: Evolution of UVX total and UVX variance by country

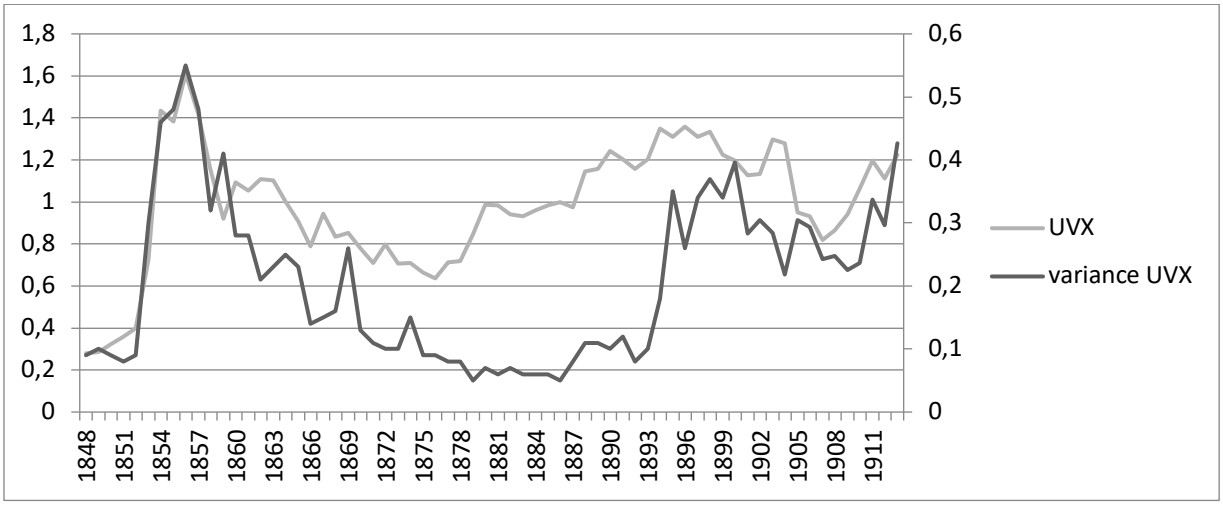


Table 1: Global view of tariff on wine between 1848 and 1913 (in francs by hectoliters)

Period	Wine characteristics				Trade agreement			Geographic Status	
	Categories			Alcohol degree				Non European	Algeria
	Ordinary wines		Liqueur wines		minimum	conventional	general		
1848-1851	Land 15	Sea 35	100	X				Same regime	Same regime
1851-1853	Land 15	Sea 35	100	X				Same regime	0
1854-1871	0.25							Same regime	0
1871-1881	0.3 or 5		0.3 or 20	X	0.3		5 to ordinary wines 20 to liqueurs wines (+ 3,6 francs to 100 kgs)	Additional +3.6 francs to kgs	0
1881-1891				X	2	negotiation	4.5	Same regime	0
1892-1898					0.7 by degree until 10.9 Additional tax on consumption by degree over 11		1.2 by degree until 10.9 Additional tax on consumption by degree over 11		
1898-1910					12 until 12 degrees Additional tax on consumption by degree over		35 until 12 degrees Additional tax on consumption by degree over		

Table 2: Market share and discrimination

Dependent variable: MS (%)	Coef.	Std. Err.	F. Stat
Discrimination rate	-0.379***	0.056	98.30***
Constant	13.255***	0.677	

Table 3: International competition and protection

Dependent variable: QI_t	Coef.	Std. Err.	F stat.
year	*0.578*	*10.06*	245.18***
ITT_t	*0.177****	*4.58*	
CD_t	*− 0.18****	*−8.94*	
Constant	− 0.59	6.897	

Note : n = 66 ; ***: significant at 1% level.

Table 4: Ranking of the main champagne markets (in number of bottles exported in 1898)

1. England	10,699,300	9. Austria-Hungary	153,300
2. Belgium	2,778,700	10. Switzerland	141,400
3. Germany	1,859,200	11. Italy	129,700
4. United States and Canada	1,419,400	12. Australia	125,600
5. Russia	498,500	13. Norway	108,200
6. Netherlands	468,000	14. Argentina	100,300
7. Sweden	259,200	15. English Indies	100,000
8. Denmark	188,700		

Source : *Le vigneron Champenois* from 18 October 1899