Causes of world trade growth in wine: 1850-1938

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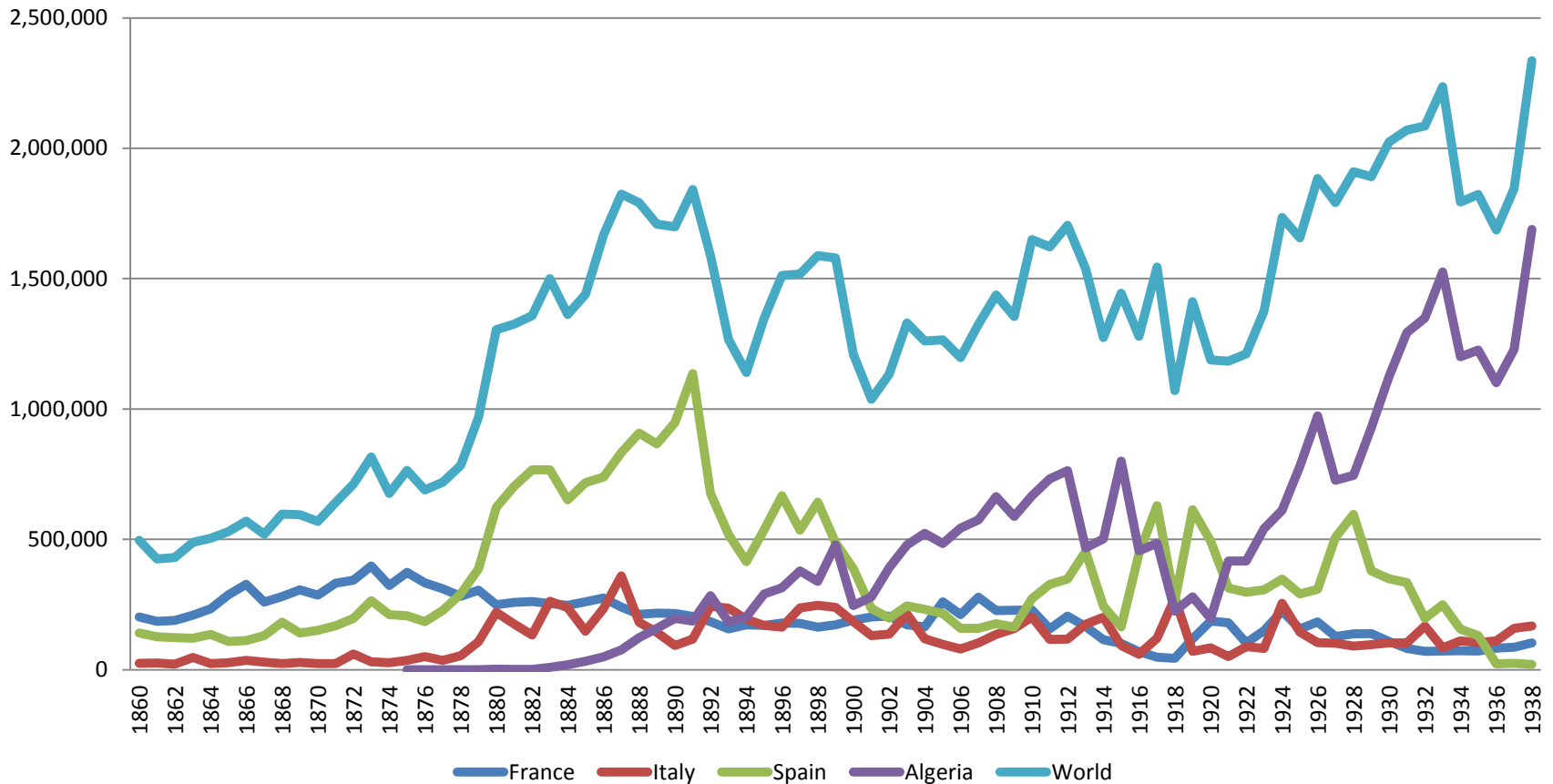**5.** Conclusions

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1. Background

- Quite abundant literature concentrated in the second wave of globalization and its impact on trade in wine: Anderson (2003, 2004)

- Fewer quantitative and econometric analyses of the functioning of the international wine market in the first wave of globalization (Pinilla and Ayuda, 2002 and 2007; Pinilla and Serrano, 2008; Ayuda et al., 2016).

- This period is of great interest as it was articulated for the first time an international wine market, key to understanding the one that will work in the second half of the 20th century
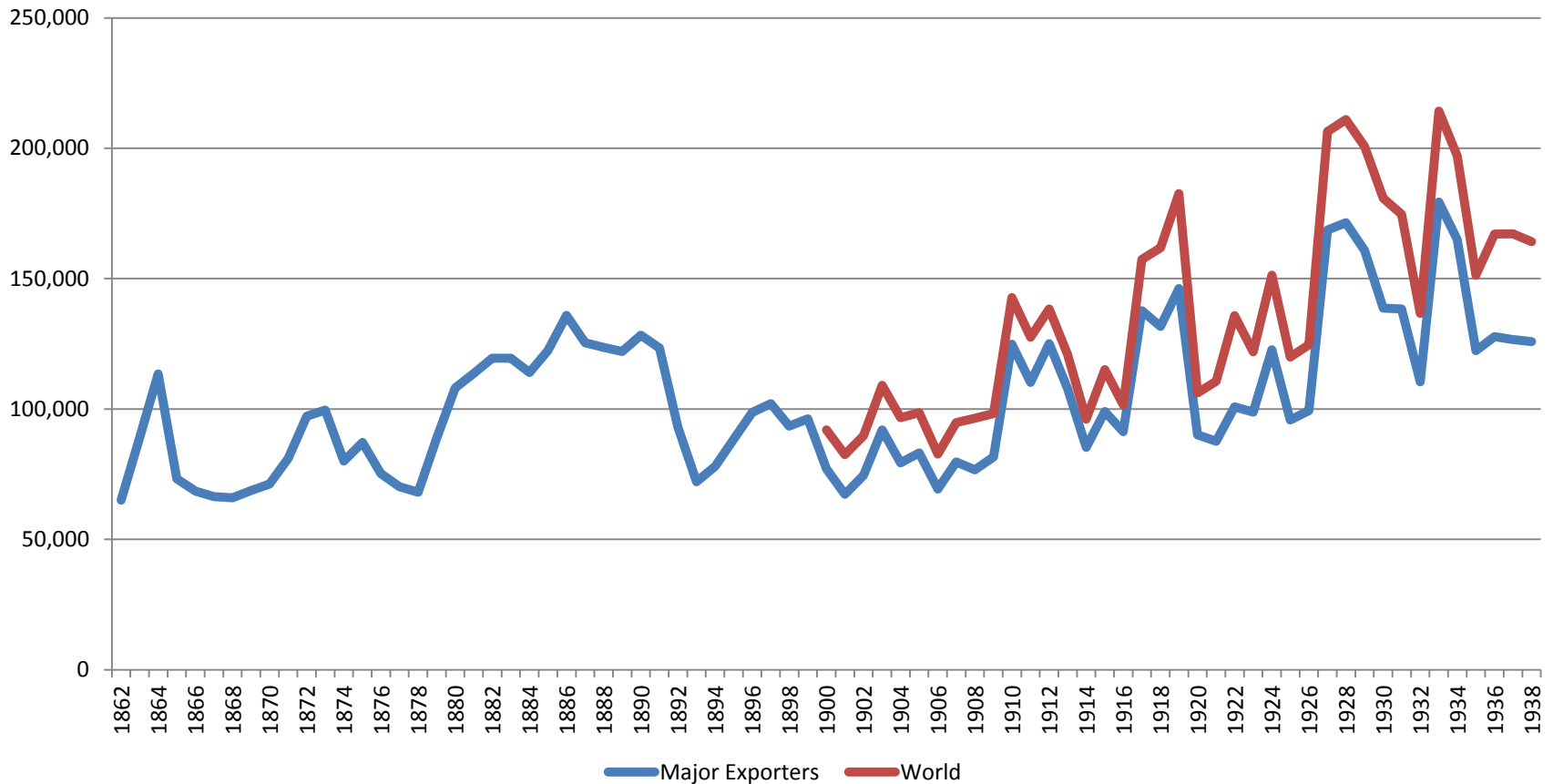
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2. Principal Research question

- To analyze the overall trajectory of wine exports and provide convincing explanations of the pattern.

- Approach that takes all the possible explanatory factors into account.

- An extended version of the gravity model applied to a panel dataset to explain world exports of wine.

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World wine exports (volume in Kl.)

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World wine exports (value, current USA $)

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World wine exports in value (shares)

Legend: France, Italy, Spain, Algeria

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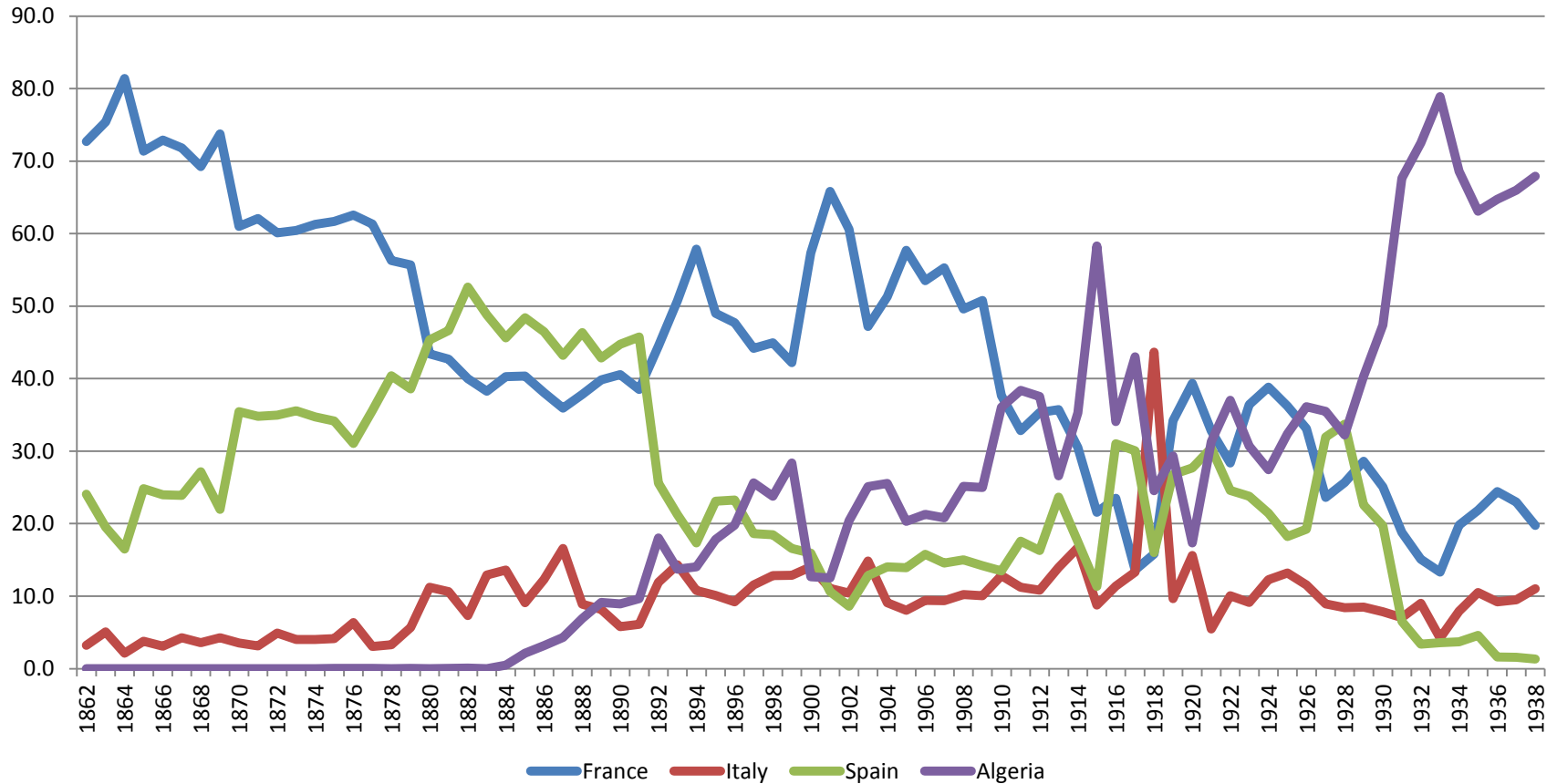
World wine imports (shares)

France/World — Major importers (Austria, Belgium, Germany, Switzerland, UK, USA, Argentina) — Rest of the world

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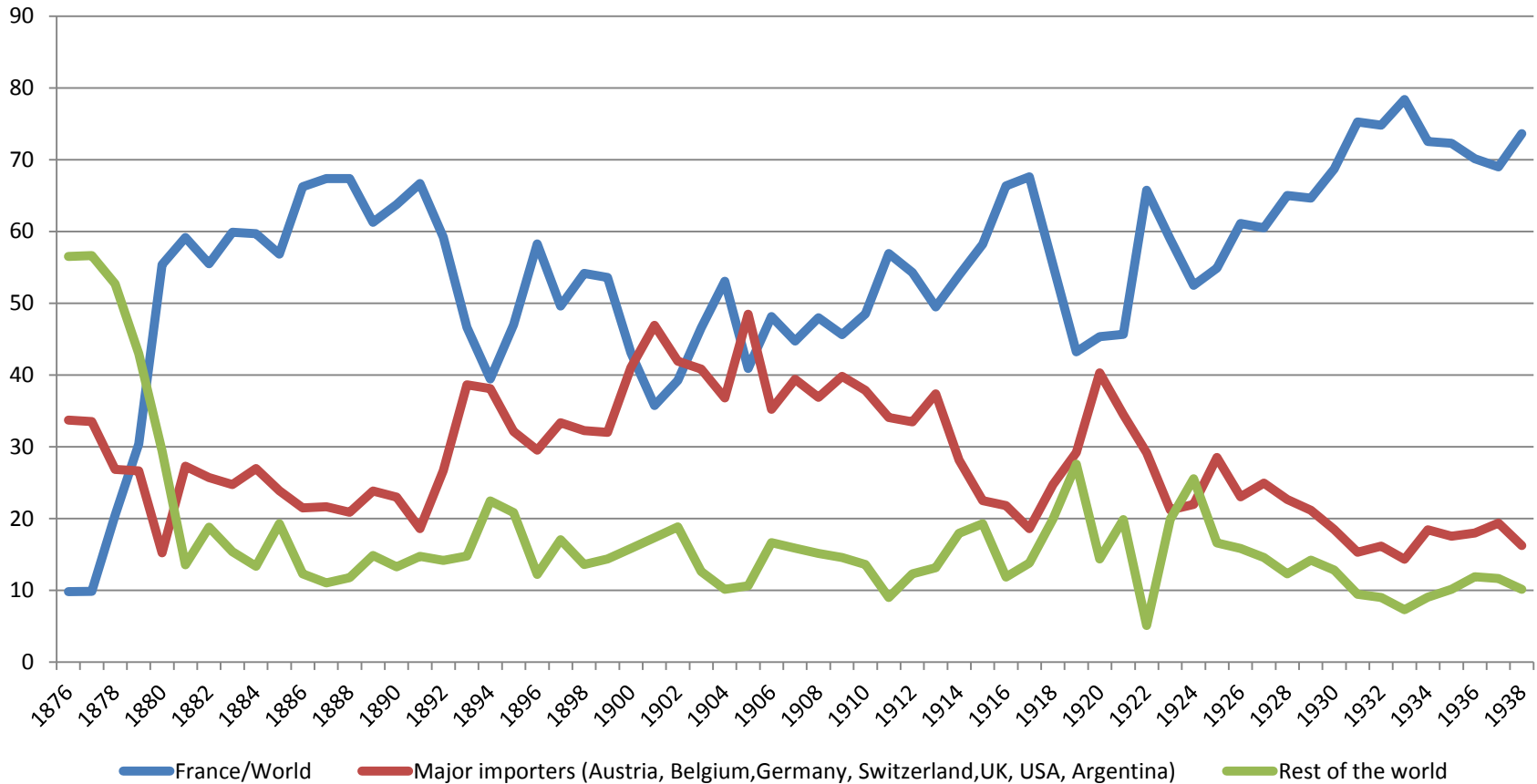
4. Empirical Framework

We followed the standard **gravity model**:

- A standard **constant elasticity of substitution** specification:

$$X_{ijt} = \beta_1 GDP_{jt}^{\beta_2} Y_{it}^{\beta_3} Y_{jt}^{\beta_4} TC_{ij}^{\beta_5} \qquad (1)$$

where:

X_{ijt} stands for wine trade exports from France, Italy, Spain and Algeria to country j at time t (export volume at 1910 prices)

GDP_{jt} stands for importer's GDP at time t

Y_{it} represents the production of wine in the exporting country i

Y_{jt} represents the production of wine for country j

TC_{ijt} is the product of the geographical distance between country i and country j and the freights cost (Tn./M.) at time t

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4. Empirical Framework

- An additive error in specification (1)

- We also used several **dummy** variables (Empire, WWI, Dep30, Soviet State, USA Prohibition, Gold Standard countries i and j)

- We included the **multilateral resistance terms** (dummies for pair fixed effects)

- We used the **Poisson pseudo-maximum likelihood estimator** (PPML)
  - Santos Silva and Tenreyro (2006, 2008, 2009, 2011), Staub and Winkelmann (2012)

4. Empirical Framework

*PPML Estimation merits:

- It is used to deal with the **zero trade and logarithm transformation**.

- **It is specified at levels** in order to avoid the problem that arose using OLS under logarithm transformation.

- It gives **the lowest bias among estimators**.

- It is **robust to heteroscedasticity**.

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4. Empirical Framework

- We estimated the model for **total exports and two different types of wine** (high/low quality):
  - 6,069 observations for low quality wine

  - 3,773 observations for high quality wine

  - 6,069 observations for total wine

- The sample has a very high coverage: 75%-85% of world exports in volume or 75%-90% in value

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4. Empirical Framework

- **Variations between units of observation and temporal variations (1848-1938)**

  - Wine exports from France, Spain, Italy and Algeria to 37 destinations.

  - 34 countries (from Europe, North America, Latin America, Maghreb and Sub-saharan Africa, Asia and Australia) and 3 groups of European colonies (French Sub-Saharan Africa, European Asian and French Indochina)

  - Volume exports: year exports at 1910 prices

  - Source: National foreign trade statistics

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4. Empirical Framework

TABLE 1: ESTIMATION OF THE GRAVITY MODELS (PPML); 1848-1938

VARIABLES	TOTAL WINE
l_GDPj	-0.0580
	(0.104)
l_esc_Yi	0.998***
	(0.148)
l_esc_Yj	-0.287***
	(0.0604)
l_Freight	-0.117*
	(0.0658)
empire	4.043***
	(0.911)
WWI	-0.208*
	(0.124)
Dep30	-0.0943
	(0.0803)
Soviet	-5.850***
	(0.482)
Prohibition	-3.667***
	(0.544)
GSij	0.154
	(0.136)
muslim	-9.606***
	(0.955)
Constant	3.089
	(1.907)
Observations	6,069
R-squared	0.899

We have used pair fixed effects. Standard errors are clustered by distance and are reported in parenthesis.
*** p<0.01, ** p<0.05, * p<0.1

Total Wine Model: Results

- Wine production in exporting countries has a **positive** relationship with wine exports (Phylloxera crisis).
- Importing country production has a negative relationship with wine exports ('**home bias**'+phylloxera).
- **Decreasing trade cost boosts exports** (negative and significant coefficient).
- **Being a colony (importing country) has a favorable effect on wine exports**.
- **Economic and political shocks have a strong impact on wine exports** (WWI, Soviet Revolution, USA Prohibition)
- Cultural distance (muslim importing country) has a negative relation with exports)

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4. Empirical Framework

TABLE 2: ESTIMATION OF THE GRAVITY MODELS (PPML); 1848-1938

VARIABLES	HIGH QUALITY (BOTTLES)	LOW QUALITY (CASKS
l_GDPj	0.457***	-0.178
	(0.132)	(0.141)
l_esc_Yi	-0.00170	1.119***
	(0.0746)	(0.114)
l_esc_Yj	-0.0962	-0.353***
	(0.0853)	(0.0847)
l_Freight	-0.0186	-0.124
	(0.0739)	(0.0850)
WWI	-0.501***	-0.262**
	(0.167)	(0.124)
Dep30	-0.614***	-0.0553
	(0.235)	(0.0499)
empire		3.005***
		(0.833)
Soviet	-7.008***	-5.275***
	(1.437)	(0.314)
Prohibition	-3.468***	-4.993***
	(0.586)	(1.093)
GSij	0.385***	0.0352
	(0.0935)	(0.131)
muslim	0.0261	-2.803***
	(0.597)	(0.650)
Constant	-1.680	4.614**
	(1.536)	(1.948)
Observations	3,773	5,887
R-squared	0.837	0.920

We have used pair fixed effects. Standard errors are clustered by distance and are reported in parenthesis.

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Quality Wine Models: Results

- Market size (importing country GDP) has a **positive relationship for high quality wine**.
- Exporting countries production only affected low quality wine
- Domestic production in importing countries has a **negative** relationship with wine exports only for low quality wine (no home bias for high quality).
- Cultural distance only affected low quality wine exports (European elites were the wine consumers in these colonies)

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5. Conclusions

- France played a key and central role in the world market: a large exporter and the main importer.

- The phylloxera plague was key to the articulation of the world wine market:
  - Turned France into a large importer
  - Dramatically boosted production and exports from other countries (mainly Spain and Algeria)

- Wine was **not a mass consumer product** except in countries of the northern shores of the Mediterranean.

5. Conclusions

- – In the rest of the world wine was consumed only by high society, metropolitan officials and military in the colonies, and emigrants in some countries of the new world

- – As it was mostly a luxury product in many countries, **strongly affected** by economic and political crises.

- – Very **sensitive** to regulations.

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5. Conclusions

– Wine was not a homogeneous product: **different dynamics** according to different types of wine

– Major differences in the competition (high vs. low quality wine)

- **Home bias**: New producing countries

- Domestic production in exporting countries only affected low quality exports

- **More competition** in the world market for low quality wines

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