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Crises and Competitiveness: Analysing the European Wine Trade Response to Economic Shocks

ABSTRACT

In recent years, the European wine industry has faced rising global competition, changing consumer preferences, and repeated economic crises. This paper explores the comparative advantages of the European Union's (EU) wine-producing and consuming countries targeting international markets from 2010 to 2023, focusing on the specific impacts of economic crises on trade competitiveness. This research identifies the leading EU wine market players and their trade dynamics. Furthermore, it assesses their competitive positions in the world wine market using international wine trade data that assesses symmetric revealed comparative advantages (SRCA) for different wine products (sparkling, bottled, and bulk wines). Furthermore, it applies econometric models to capture the impacts of recent economic crises. Results suggest that traditional wine-exporting countries such as France, Italy, Spain, and Portugal were able to preserve their comparative advantage in the last decades despite declining consumption trends. Results show a stable comparative advantage in bottled wine categories despite the pressure of economic crises. Findings provide recommendations for policymakers and wine industry players to identify the dynamics behind the global wine trade pattern considering, different product segments.

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Introduction

Wine has continuously played a significant role in human history, influencing cultural traditions, regional economies, and agricultural development worldwide (Varriano, 2010; Harutyunyan and Malfeito-Ferreira, 2022). In particular, the wine sector represents strategic importance within the European Union (EU), contributing substantially to the agricultural sector, employment, and export revenues (Pomarici and Sardone, 2020).

The global wine industry has undergone significant changes in recent decades, marked by consistent worldwide and EU consumption declines. In 2024, global wine production decreased by 4.8% compared to 2023, marking the second consecutive year of substantial decline, resulting in the lowest level recorded since 1961. Global wine consumption decreased by 3.3% in 2024. The drop in global wine consumption since 2018 is attributed to the decline of the Chinese market, COVID-19, and geopolitical tensions. However, in 2021, a recovery was observed; in 2022, the market was characterised by declining demand, high prices, and low production volumes (OIV, 2025). These trends are shaped by changing consumer preferences, increased health awareness, and the growing popularity of alternative low- and non-alcoholic beverages (Galanakis, 2020; Tireki, 2021). Recent trends indicate a continuous decline in the European Union wine consumption, increasing wine imports (Ohana-Levi and Netzer, 2023), driven by shifting consumer preferences toward sustainable wine products (Bazzani *et al.,* 2020), influenced by additional economic factors (Balogh and Ferto, 2015). Furthermore, the changing wine consumption patterns of the young generation are also reshaping the competitive dynamics of the wine industry. In addition, traditional European wine-producing countries are facing increasing pressure from emerging wine producers of the New World, such as South America, Australia, and Asia, benefitting from modern production techniques, trade development and competitive pricing to expand their market share and conquer international markets (Villanueva and Ferro, 2022). These structural changes are depressed by external shocks such as the 2007–2008 financial crisis, the COVID-19 pandemic (del Rey and Loose, 2023), and the economic disruptions caused by geopolitical conflicts. These events have influenced production costs and trade dynamics and accelerated changes in consumer behaviour (Santeramo, 2025; Haniotis, 2025), thus affecting the global trade competitiveness of the leading EU wine producers. While the EU remains a dominant player in global wine exports, there is a need to reassess its comparative and competitive advantages in light of these changing circumstances.

In classical trade theories, the Ricardian model of comparative advantage offers a practical framework to explore

international trade flows and characteristics in the wine sector. David Ricardo discovered the law of comparative advantages in 1816. Learning about Ricardo's discovery facilitates the evaluation of the history of economic direction (Ruffin, 2002). Ricardo's concept, as interpreted by Maneschi (2008), emphasises the role of labour productivity and trade liberalisation in generating mutual gains from trade. This theoretical framework has been widely applied to the wine industry to explain the long-lasting specialisation of certain viticultural regions and to assess the determinants of their competitiveness (Rocchi and Gabbai, 2013). The theory of comparative advantages has been employed to explain the specialisation of territories in wine-producing regions over the centuries; the findings of Rocchi and Gabbai (2013) suggest that a strong territorial identity is necessary but insufficient for building a competitive advantage.

Identifying competitiveness and comparative advantages is essential for monitoring and supporting the European wine sector's trade performance. This research addresses a significant gap in the literature by providing an updated analysis of the comparative trade advantages of major European wine-producing countries, considering various product groups (sparkling, bottled and bulk wines), global market competition and recent economic crises. Specifically, it examines the trade positions of the most dominant EU wine exporters, identifies their strengths and weaknesses, and investigates how external economic shocks from 2010 to 2023 have impacted the global competitiveness of their wine trade.

Theoretical framework

The evolution of trade theories from mercantilism to modern competitiveness models has a rich literature in economic history, with different theories providing an complex picture of how international trade works. Classical theories are based on absolute and comparative advantages, while neoclassical and new theories have emphasised the role of factors of production, technology, innovation and competitiveness (Jambor and Babu, 2016).

Adam Smith's theory of absolute advantage was further developed in 1817 by the British businessman David Ricardo, one of the most well-known figures in English classical economics. Ricardo (1817) argued that relative advantage is a more important factor in trade than absolute advantage. A country can benefit from trade even if it is less efficient than another country in producing all its products but has a relative advantage in producing some products. Ricardo called his concept the theory of comparative advantage (Ricardo, 1817). In line with his concept, mere technological development (for example, high labour productivity) does not guarantee high competitiveness under circumstances where another country has a comparative advantage in the production of a given product (Jambor and Babu, 2016). Later, Maneschi (1992) extended Ricardo's international trade theory to incorporate more goods and allow trade between countries. Finally, Cho and Moon (2000), in their book entitled "Evolution of Competitiveness Theory", discussed the competitiveness theory from Adam Smith to Michael Porter. They concluded that Porter's "Diamond" model is particularly valuable for analysing competitiveness regarding globalisation.

A two-sector international trade model offered by Nordås (2000) focuses on one country's comparative advantage and suggests an equilibrium where the smaller nation exports a given good while the larger nation loses from trade. Deardorff (2005) meanwhile discussed the theoretical development of comparative advantage, tracing back to Ricardo's two-good model extension. He argues that results can be extended to multiple goods and countries, but under general assumptions, weaker results can be derived, often in the form of correlations between comparative advantage and trade. Finally, Costinot (2009) provided a unifying perspective on the fundamental forces shaping comparative advantage in neoclassical trade theory. In a generalisation of the Ricardian model, he identified sufficient conditions on factor productivity and supply to predict international specialisation patterns.

This research is based on the theoretical framework derived from classical trade theories, namely the Ricardian theory of comparative advantage (Ricardo, 1817) and its empirical application through the revealed comparative advantage (RCA) indices proposed by Balassa (1965) and symmetric revealed comparative advantage (SRCA) further developed by Dalum *et al.* (1998).

The empirical literature on revealed comparative advantages

An extended empirical literature is dedicated to analysing comparative advantages in the agri-food trade. In the last decades, academics have addressed research on the competitiveness of various agricultural sectors and food products (Mizik 2021a, 2021b). Applying panel econometrics, Török and Jámbor (2016) investigated determinants of revealed comparative advantages in the European ham trade from 1999 to 2013. Results show that quality linked to the production area significantly affects competitiveness, while EU accession positively correlates with competitiveness in referred industries. In addition, Jámbor and Gibba (2017) researched the comparative advantages of the global peanut trade. They explored the duration and stability of Balassa indices using Markov transition probability matrices and the Kaplan-Meier survival function. They show India, China, and Argentina are the largest peanut exporters, while Senegal, Nicaragua, and Argentina have the highest Balassa indices. They concluded that the comparative advantages have weakened for most of the countries selected. Furthermore, other scholars (Balogh and Jámbor, 2018) assessed trade competitiveness in the European cheese sector using Balassa indices between 1990 and 2013. They revealed that European cheese exports targeted the EU single market, which is highly concentrated, with the Netherlands, Denmark, and Cyprus being the most competitive cheese traders (Balogh and Jámbor 2018). Furthermore, Mizik (2021a) provided an overview of ASEAN member states' agri-food trade using world and regional-level data. He calculated country-level competitiveness using four Balassa-type indices, reveal-

ing a tight connection between competitiveness theory and practice. Countries with significant agri-food production (Thailand, Indonesia, Vietnam, and Malaysia) have higher comparative advantages, helping to understand their trade specialisation and international trade performance. Moving to alcoholic beverages, Benus *et al.* (2021) researched the Slovak spirits industry in the EU. Slovakian spirits attributed high added value and export potential but experienced a downturn in competitiveness from 2004 to 2018. Despite this, some spirit products remained competitive and represent most of the country's exports. Török and Jámbor (2013) analysed the competitiveness of fruit spirits in Central and Eastern Europe and found declining competitiveness on EU-15 markets. In the early 2020s, Mizik (2021b) published a detailed literature review on the competitiveness of the agri-food trade. The systematic review identified supportive legislation, higher value-added goods, and efficient production as significant factors for higher competitiveness. Beyond the agri-food sector, rich literature can be found on revealed comparative advantages applied to the wine industry.

Revealed comparative advantages in the wine industry

The global wine trade is a dynamically changing industry, influenced by many factors that determine the competitiveness of wine-producing and exporting countries. These factors range from economic conditions to trade policy and market characteristics. This section explores literature analysing the main drivers of competitiveness in the global wine trade and depicting insights from various studies on the competitive trade performance of the wine sector. Five main lines of empirical literature emerged from this topic, investigating the revealed comparative advantages of the wine industry at the global level and country-level analysis.

Global wine market analysis

In a global context, Balogh and Fertő (2015) analysed the key factors driving the competitiveness of the international wine trade, including economic development, agricultural employment, grape area harvested, and WTO memberships, while exchange rate volatility negatively impacts export competitiveness, as indicated by the revealed comparative advantage indices from 2000 to 2013.

Regional strategies also drive the competitiveness of wine producers. In the Old Wine World, e.g. the Burgundian region, wine makers emphasise tradition and terroir, while the New World, e.g., New Zealand and South Africa, focus on modernisation and innovation. These divergent strategies reflect the interchange between firm-specific factors and regional settings (Chauvin *et al.,* 2024). In addition, commitment to quality is a common factor across regions. Wine producers in Burgundy, New Zealand, and South Africa prioritise quality as a competitive advantage, though they achieve it differently (Chauvin *et al.* 2024). Market dynamics and evolving consumer preferences are critical drivers of competitiveness in the global wine trade. The rise of New World producers has been driven by their ability to respond to changing consumer preferences, particularly in branding, packaging, and marketing strategies (Rabellotti *et al.,* 2010).

Emerging wine markets

The global wine trade is affected by emerging trends, such as the rise of new wine consuming countries, the increasing importance of quality and demand-driven attributes, and the growing role of promotional marketing (Bardají and Mili, 2009). Emerging markets, such as China, India, and Russia, are expected to play a significant role in shaping the future of the global wine trade. These markets are characterised by growing demand for high-quality wines, presenting opportunities for Old and New World producers (Bargain *et al.,* 2018; Mariani *et al.,* 2014). Their comparative advantages influence the competitive positioning of wine-producing countries. Utilising Porter's "Diamond" framework, Castaldi *et al.* (2006) have identified that countries like the United States, Australia, and Chile have strong competitive positions due to their adaptive, large-scale producers and attractive investment environments. On the contrary, traditional European producers, such as France and Italy, face challenges due to declining consumption rates and weak economies of scale in production. In turn, emerging countries can better adapt to international market demands and attract more foreign investments (Castaldi *et al.,* 2006; Rabellotti *et al.,* 2010).

Competitiveness and trade policy

International trade policies and free trade agreements significantly influence the competitiveness of wine-exporting countries. The European Union (EU) has historically been a dominant player in the global wine trade, but New World producers like Chile, Australia and New Zealand are weakening their market position. These countries are actively negotiating Free Trade Agreements (FTAs) to gain preferential access to fast-growing markets, such as China, India, and South Korea (Mariani *et al.,* 2014). The EU's trade policy has shifted from protecting domestic markets to promoting quality production and competitiveness. However, stalling multilateral trade negotiations, such as the Doha Round, has led to a rise in bilateral agreements, which are reshaping the global wine trade landscape (Mariani *et al.,* 2014). Analysing the global comparative advantage of the EU wine industry, Balogh and Jámbor (2017) demonstrated that EU members are the highest-ranked European wine producers. However, their commercial advantages have weakened over time. Reasons for this downturn include changes to the wine regulation of the EU Common Agricultural Policy and the rise of New World wine producers.

Country-level analysis

Regarding country-level analysis, Bozsik (2005) and Balogh (2014) analysed the international competitiveness of the Hungarian wine trade with revealed comparative advantage indices. They concluded that Hungary ranked among

the middle-competitive wine producers, and the market share in the EU has declined except for bottled quality white wines. In addition, while the Hungarian wine industry was competitive at the turn of the millennium, it has become less competitive in the last decade. Balogh (2014) also observed a declining domestic demand market and shrinking international export competitiveness of Hungarian wines. Analysing the competitiveness of Italian wines in the international market, Crescimanno and Galati (2014) revealed that the Italian wine sector has shown resilience amidst the global economic crisis of 2007-2008 by meeting the diverse demand for quality wines. Competitiveness analysis revealed increased competitiveness in Asian, East, and North European markets, where health attributes and Italian lifestyle are strategic factors. However, disadvantages exist in traditional markets such as France and new producing markets (e.g. the United States), requiring more focused marketing strategies.

This review suggests that there is still room for analysis of competitiveness in the wine industry, especially since studies detecting the influence of economic crisis are lacking in the literature.

Methodology and data

Methodology applied

This research builds on the Ricardian theory of comparative advantage and its empirical application from classical trade theories. The revealed comparative advantage is regularly measured by international trade statistics. Balassa (1965) specified a trade-related indicator capturing the revealed comparative advantages as follows:

$$\mathrm{BRCA_{ij}} = \left(\frac{X_{ij}}{X_{it}}\right) \Big/ \left(\frac{X_{nj}}{X_{nt}}\right) \quad (1)$$

Where X means export, i indicates a given country, j is a given product, t is a group of products, and n is a group of countries. A revealed comparative advantage index of exports is calculated by comparing a given country's export share of its total exports with the export share in total exports of a reference group of countries. For example, suppose that the value of the BRCA index is higher than one. In that case, a given country has a comparative advantage compared to the reference countries or, in turn, a revealed comparative disadvantage if the BRCA is smaller than one. The BRCA index has received criticism for neglecting the impacts of agricultural policies and for exhibiting asymmetric values. Furthermore, the asymmetric nature of the BRCA index is evident in that it can range from one to infinite when a country has a comparative advantage. On the contrary, in the case of comparative disadvantage, the index value falls between zero and one, which tends to overestimate the relative importance of a sector. To overcome the asymmetric challenge of the index, Dalum et al. (1998) created the Symmetric Revealed Comparative Advantage (SRCA) index, calculated as follows:

$$SRCA = \frac{(BRCA-1)}{(BRCA+1)} \quad (2)$$

The values of SRCA (Symmetric Revealed Comparative Advantage) indices range from -1 to 1. Values between zero and one indicate a comparative export advantage, while values between -1 and 0 indicate a comparative export disadvantage. Since the RSCA is symmetrical around zero, this prevents potential bias (Dalum *et al.,* 1998).

Data used

The panel data (number of countries is 28, number of years is 24) for this analysis was retrieved from the World Bank World Integrated Trade Solution (WITS) database from 2010 to 2023, selecting wine products at the HS-6-digit level, covering EU-28 member states'[1] wine exports to global markets. Three wine product categories are analysed: sparkling wine (HS 220410), bottled wine (HS 220421, containers ≤ 2 litres), and bulk wine (HS 220429, containers >10 litres) available in World Bank (2024) disaggregated trade statistics (Table 1). The reference export market selected is the world wine market – the main wine target markets of the European Union.

Table 1: Product categories for wine at HS-6-digit level trade statistics

HS-6-digit level code	Product description	Short description
220410	wine, sparkling	sparkling wine
220421	wine, still, in containers holding 2 liters or less	bottled wine
220429	wine, still, in containers holding more than 10 liters	bulk wine

Source: Word Bank (2024) WITS data.

To capture the causal effect of economic shocks, Arellano-Bover/Blundell-Bond system linear dynamic panel-data estimation (DPDsys) was applied (Arellano and Bover, 1995; Blundell and Bond, 1998) to the equation measuring the impact of crises on comparative advantages in the wine sector:

$$SRCA_{ij} = \alpha + \beta_1 \ln(\mathrm{GDPpercapita})_{ij} + \\ + \beta_2\, \mathrm{financial\ crisis}_{ij} + \beta_3 \mathrm{COVID19}_{ij} + \beta_4 \mathrm{Russian} - \\ - \mathrm{Ukranian\ war}_{ij} + u_{ij} \quad (3)$$

Where:
α is the constant term;
β are the estimated coefficients;
i represents 27 member states of the EU and the UK;
j is the year range between 2010 and 2023;
u is the error term.

[1] Sample countries cover Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, and the United Kingdom.

SRCA (Symmetric Revealed Comparative Advantages) captures the symmetric revealed comparative advantage indices of EU member states (including the UK) on the global wine market. Explanatory variables selected as GDP per capita (measured at PPP current international prices), 2007-2008 financial crisis (1 if the year equals 2007 and 2008, 0 otherwise), COVID-19 (1 if the year equals 2021 and 2022, 0 otherwise), and Russian-Ukrainian war (1 if year equals to 2022 and 2023, 0 otherwise).

Results

Table 2 presents the average market share of different wine categories (sparkling, bottled, and bulk) in the EU's total wine trade shipped to the world wine market from 2010 to 2023. Bottled wine dominates trade, accounting for 69% of exports and 67% of imports. Sparkling wine also accounted for a significant share of 23% of exports and 18% of imports, reflecting its premium market value. Bulk wine had a lower share (7.9% of exports, 15% of imports), illustrating the main category for lower-priced wine markets.

Table 2: The market shares of wine product category in total EU wine trade, 2010-2023

Product	Product Code (HS-6-digit level)	Wine export share in total wine export	Wine import share in total wine import
Sparkling wine	220410	23%	18%
Bottled wine	220421	69%	67%
Bulk wine	220429	7.9%	15%
Grape must*	220430	0.4%	0.3%
Total		100%	100%

Note: Grape must have been dropped for further analysis because it is not a wine product.
Source: Own composition based on Word Bank (2024) data

The most competitive market leaders in the EU wine trade

Regarding wine trade (Table 3), France, Italy, and Spain were the top performers in bottled wine exports between 2010 and 2023. France emerged as the leader in the sparkling wine market, with Italy and Spain following behind. The bulk wine trade was driven by Spain and Italy, followed by France.

Wine trade competitiveness at different product levels in the EU

Table 4 illustrates the SRCA indices for sparkling, bottled, and bulk wine across the EU countries from 2010 to 2023. France retains its dominant position for sparkling wine, with the highest SRCA score, increasing from 0.888 in 2010 to 0.902 in 2023. This is attributed to the high-quality French Champagnes and Crémant as Dom Pérignon, Ruinart, Deutz, Moet & Chandon, Krug, Veuve Clicquot, Crémant Alsace, Crémant Bourgogne, Crémant Bordeaux etc.). France followed by Spanish (Cava) and Italian (Prosecco) sparkling wine products, with a lower SRCA index. Italy and Spain lagged behind France in terms of sparkling wines, although Spain experienced a decline in comparative advantage over time. SRCA values have weakened for Luxembourg, while Belgium and Portugal had relatively low indices.

Regarding bottled wine, Portugal had the highest SRCA index (0.829>0) in 2010, and that position was taken over by France in 2023 (SRCA 0.826>0). Italy was able to maintain its competitive position in bottled wine exports. Spain witnessed a slight decline in SRCA for bottled wine, while Greece entered the top five rankings.

Regarding bulk wine export, Spain leads this wine product category, showing stability in comparative advantage on world markets. France, Portugal and Italy maintained their

Table 3: The top 5 exporters and importers of wine product category (HS-6-digit level), in the EU 2010-2023

Wine exports in thousand USD					
country	sparkling	country	bottled	country	bulk
France	3,029,800.0	France	5,582,289.0	Spain	497,181.6
Italy	915,645.4	Italy	4,055,838.0	Italy	412,710.3
Spain	446,397.5	Spain	1,629,400.0	France	355,942.5
Germany	108,883.0	Germany	790,563.8	Germany	87,632.1
Netherlands	58,126.5	Portugal	747,954.0	Portugal	60,488.7
Wine imports in thousand USD					
United Kingdom	819,016.0	United Kingdom	3,414,700.0	United Kingdom	546,014.5
Germany	458,713.5	Germany	1,780,848.0	Germany	518,292.8
Belgium	289,465.6	Netherlands	985,422.8	France	240,531.7
Italy	190,947.2	Belgium	714,044.4	Sweden	158,098.7
Netherlands	109,407.3	Denmark	489,246.3	Denmark	109,442.2

Source: Own composition based on Word Bank (2024) data

Table 4: SRCA indices for three different wine categories (HS-6-digit level), in the EU 2010 and 2023

Sparkling wine			
Countries	2010	Countries	2023
France	0.888	France	0.902
Spain	0.720	Italy	0.797
Italy	0.603	Spain	0.515
Luxembourg	0.501	Luxembourg	0.382
Portugal	0.221	Belgium	0.342
Bottled wine			
Portugal	0.829	France	0.826
France	0.757	Portugal	0.802
Italy	0.733	Italy	0.762
Spain	0.648	Spain	0.601
Cyprus	0.322	Greece	0.159
Bulk wine			
Spain	0.782	Spain	0.814
Cyprus	0.748	Portugal	0.744
Portugal	0.695	Italy	0.628
Italy	0.667	France	0.550
France	0.528	Hungary	0.383

Note: The SRCA ranges from -1 to 1. SRCA values above 0 indicate a comparative export advantage while values below 0 indicates a comparative export disadvantage.
Source: Own composition based on Word Bank (2024) data

Table 5: Panel regression results for period of 2010-2023 in the EU

Model	(1)	(2)	(3)
Wine product category (HS-6-digit level)	bottled	sparkling	bulk
Estimation method	DPDsys	DPDsys	DPDsys
VARIABLES	SRCA	SRCA	SRCA
L.SRCA	0.884***	0.822***	0.710***
	(0.021)	(0.034)	(0.026)
ln(GDPpercapita)	0.030**	0.106***	-0.001
	(0.013)	(0.022)	(0.031)
financial_crisis_2007-2008	0.012	0.041***	-0.058***
	(0.0110)	(0.015)	(0.019)
COVID-19	-0.035***	-0.116***	-0.038*
	(0.011)	(0.017)	(0.020)
Russian_Ukranian_war	0.082***	0.201***	0.012
	(0.014)	(0.022)	(0.026)
Constant	-0.336**	-1.167***	-0.031
	(0.143)	(0.242)	(0.321)
Observations	636	630	616
Number of countries	28	28	28

Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
Source: Own composition based on Word Bank (2024) data

leading competitive positions, while Cyprus had a high SRCA score in 2010, which dropped out of the rankings by 2023.

The top wine exporting countries held solid comparative advantages, although some showed declining trends (e.g., Portugal in the bottled wine category). France retained its dominance in sparkling wine exports, while Spain and Luxembourg perceived weakening competitiveness. Traditional EU wine producers (France, Italy, Spain, and Portugal) were dominant in bottle wine export, though with fluctuating SRCA values. Spain was a global market leader in bulk wine export competitiveness, with stable comparative advantages.

Impacts of economic crisis on EU wine trade competitiveness

The econometric results from the panel regression analysis (Equation 3) illustrate the determinants of the Symmetric Revealed Comparative Advantage (SRCA) index (equation 2) across different categories of wine products: bottled, sparkling, and bulk wine (Table 5) in the EU. The lagged SRCA coefficient is positive and highly significant across all specifications, indicating a strong persistence in comparative advantage over time. This effect is most considerable for bottled wine (0.884), followed by sparkling wine (0.822),

and the lowest for bulk wine (0.710), suggesting that competitive advantages are more stable in higher-value product segments.

The financial crisis of 2007-2008 has had heterogeneous effects across wine categories. While its impact on bottled wine is not statistically significant, it is positively significant for sparkling wine (0.041, $p < 0.05$), indicating a potential increase in comparative advantage in this product segment during economic downturns. In contrast, its effect on bulk wine has been negative (-0.058, $p < 0.01$), implying that lower-value wine exports were adversely affected by crises. The COVID-19 pandemic exerts a negative impact across all wine categories traded. The most significant decline is observed in sparkling wine (-0.116, $p < 0.01$) and bottled wine (-0.035, $p < 0.01$) category, followed by bulk wine (-0.038, $p < 0.1$). These findings align with the decline in on-trade consumption during 2020–2021, which mainly affected premium wine segments usually consumed by the hospitality and restaurant industry.

The impact of the war between Russia and Ukraine was positive and significant for bottled (0.082, $p < 0.01$) and sparkling wines (0.201, $p < 0.01$), while its effect on bulk wine was not statistically significant. This result suggests that geopolitical instability may have reinforced the comparative advantage of higher-value wine categories, possibly due to changes in global trade flows and a shift in demand toward well-established European markets (the United States, Canada, Hong Kong, Singapore and China).

These results underline the resilience of high-end wine market segments to external shocks and reinforce the importance of trade policy instruments adapted to the specific wine products hit by the effects of various crises.

Discussion and conclusions

Competitiveness and comparative advantages have become critical issues in the EU wine market and international trade analysis. The European wine sector is strategically significant for contributing to the European economy and cultural heritage. However, the recent crisis arising from the COVID-19 pandemic and then geopolitical conflict has placed additional pressure on the European wine industry, intensifying existing challenges related to declining market demand, rising production production costs, and intensified trade competition.

While competitors such as New World and emerging wine exporters strengthened their positions, global consumer behaviour experienced substantial changes toward sustainable low-alcoholic drinks. Understanding the factors that influence competitiveness in the European wine industry is essential for ensuring its long-term competitiveness and market growth.

This paper revealed that European wine-producing countries retain stable but decreasing comparative advantages in line with the previous findings of Balogh and Jámbor (2017). While traditional wine exporters like France, Italy, Spain, and Portugal remain dominant players in the global market, increasing competition and economic disruptions have weakened their trade position and competitiveness, according to Chauvin *et al.* (2024).

Results suggest that traditional EU wine countries are the highest ranked globally and have a considerable comparative advantage in bottled wine products with an altering trend. Several reasons are behind the fluctuating trend in comparative advantages. Economic shocks and shifting consumer preferences have recently shaped the European wine industry, hitting bulk wine exports. The reform of the EU Common Agricultural Policy (CAP) has reduced the production of low-quality wines, as vineyard restructuring and de-plantation programmes have encouraged a focus on higher-quality production (bottled wines). These policy reforms promoting quality production, greening, and sustainability have restructured viticulture by emphasising environmental consciousness and long-term competitiveness. Wine producers must adapt to changing regulatory frameworks and market expectations as sustainability gains space in global demand.

The COVID-19 pandemic transformed wine consumption patterns between 2020 and 2021, accelerating the shift toward online retail and off-trade channels while reducing on-trade consumption in all wine product categories. Moreover, the war in Ukraine introduced additional economic instability, generating an energy crisis, rising production costs, and inflationary pressures across the EU. Higher input costs in the wine industry, e.g., energy, transportation (fuel), and raw materials (oak, barrels), have negatively affected winemakers' profitability. Furthermore, food inflation has constrained household purchasing power, contributing to declining demand for alcoholic beverages. This economic environment has posed challenges for wine producers, particularly those reliant on price-sensitive consumer segments.

Despite these challenges, premiumisation has strengthened, driving price increases in the super-premium and fine wine segments. Prestige wine regions, including Bordeaux and Burgundy in France, Tuscany in Italy, and La Rioja in Spain, have experienced increased demand for high-end wines, reinforcing the importance of brand value, heritage, and quality perception. While this trend benefits premium producers, it differentiates market segments and intensifies competition among mid-range and lower-tier wines (bulk category).

Regarding changing consumer preferences, Generation Z exhibits lower alcohol consumption rates than other age groups, favouring low-alcohol beverages, hard seltzers, and cocktails over traditional wines. This shift presents a challenge for wine producers seeking to engage younger consumers while maintaining the authenticity and tradition of wine culture. The wine industry must respond with innovation in product offers, new marketing strategies, and branding to meet new expectations. Adapting to these changes requires more flexibility in strategic planning, investment in new practices, and a knowledge of consumer behaviour.

This research highlights the need for sectoral and trade policy incentives to sustain the competitiveness of the European wine industry. Strengthening high-quality wine production and adaptation to changing consumer behaviour through EU agricultural policy is required for EU wine producers'

product differentiation and market positioning. Policies promoting sustainable certification, geographical indications, and innovation in viticulture can enhance global competitiveness. By analysing the pattern of competitiveness across global wine markets, this research contributes to wine economics literature by evaluating wine trade competitiveness and its determinants and updating EU wine trade policy strategies.

As to limitations, the analysis relies on the comparative advantages, which, despite its benefits in assessing trade patterns, operates under several simplifying assumptions that may not completely align with the realities of the global wine market. One fundamental limitation is the assumption of perfect competition, which does not accurately reflect the market structure of the wine industry, where branding, regional reputation, producer differentiation and trade regulation play significant roles. The model also assumes that goods such as bottled and sparkling wines are homogeneous. However, different bottled or sparkling wines exhibit substantial heterogeneity in quality, production methods, and regional characteristics; thus, making direct comparisons across producers and countries is challenging. Moreover, the model presumes the absence of market-distorting trade policies. At the same time, the European Union's Common Market Organization (CMO) for wine introduces regulatory measures to influence production, pricing, and trade flows. The assumption of free trade between EU countries applies (as the Union's market is a common market) but it does not apply to the global world market. Furthermore, the model does not account for transportation costs. These limitations suggest that while the comparative advantage provides a practical tool, its application to the wine industry requires further consideration of the structural complexities of the markets.

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